Features of Mobile Subscriber Radio Handset (LG-ID3100 Type)

1. Wave Type

- G7W

2. Frequency Scope

- Transmit Frequency : 824.820 ~ 848.190MHz
- Receive Frequency : 869.820 ~ 893.190MHz

3. Rated Output Power

- 0.282W(24.5dBm)

4. Output Conversion Method : This is possible by correcting the key board channel.

5. Voltage and Current Value of Termination Part Amplifier(Catalogue included)

Mode	Type Name	Voltage	Current	Power
CDMA	SKY77162	3.4V	455mA	0.282W

6. Functions of Major Semi-Conductors

Classification	Function
QSC6010	MSM baseband, radioOne RF, and power management.
MCP (PF38F2040W0YBQ0)	Flash Memory (64Mbit) ▶ Storing of the mobile station operation program
MCP (PF38F2040W0YBQ0)	PSRAM (32Mbit) ▶ Temporary storing of the data created while busy

7. Frequency Stability

- ±0.5PPM

CDMA MOBILE SUBSCRIBER UNIT

LG-ID3100

SERVICE MANUAL

SINGLE BAND
CDMA MOBILE PHONE

Table of Contents

General Introduction

The LG-ID3100 cellular phone functions as digital cellular phone worked in CDMA (Code Division Multiple Access) mode.

CDMA mode applies the DSSS (Direct Sequence Spread Spectrum) technique that has been used in military. This technique enables to share one frequency channel with many users in the same specific area. As a result, that it increases the capacity 10 times more compared with that in the analog mode (AMPS) currently used.

Soft/Softer Handoff, Hard Handoff, and Dynamic RF power Control technologies are combined into this phone to reduce the call being interrupted in a middle of talking over phone.

CDMA digital cellular network consists of MSC (Mobile Switching Office), BSC (Base Station Controller), BTS (Base station Transmission System), and MS (Mobile Station). Communication between MS and BTS is designed to meet the specification of TIA/EIA/IS-95-A/B/C (Common Air Interface). MS meets the specifications of the below :

- TIA/EIA/IS-95-A/B/C (Common Air Interface) : Protocol between MS and BTS
- TIA/EIA/IS-96-B : Speech CODEC
- TIA/EIA/IS-98 : Basic MS functions
- IS-126 : Voice loopback
- TIA/EIA/IS-99 : Short Message Service, Asynchronous Data Service, and G3 Fax Service

LG-ID3100 is composed of a transceiver, a adapter, a Li-Polymer Battery.

CHAPTER 1. System Introduction

1. System Introduction

1.1 CDMA Abstract

The cellular system has a channel hand-off function that is used for collecting the information on the locations and movements of radio mobile telephones from the cell site by automatically controlling several cell site through the setup of data transmission routes and thus, enabling one switching system to carry out the automatic remote adjustment. This is to maintain continuously the call state through the automatic location confirmation and automatic radio channel conversion when the busy subscriber moves from the service area of one cell site to that of another by using automatic location confirmation and automatic radio channel conversion functions. The call state can be maintained continuously by the information exchange between switching systems when the busy subscriber moves from one cellular system area to the other cellular system area.

In the cellular system, the cell site is a small-sized low output type and utilizes a frequency allocation system that considers mutual interference, in an effort to enable the re-use of corresponding frequency from a cell site separated more than a certain distance. The analog cellular systems are classified further into an AMPS system, E-AMPS System, NMT system, ETACS system, and JTACS system depending on technologies used.

Unlike the Time Division Multiple Access (TDMA) or the Frequency Division Multiple Access (FDMA) used in the band limited environment, the Code Division Multiple Access(CDMA) system which is one of digital cellular systems is a multi-access technology under the interference limited environment. It can process more number of subscribers compared to other systems (TDMA system has the processing capacity three times greater than the existing FDMA system whereas CDMA system, about 12~15 times of that of the existing system).

CDMA system can be explained as follows: TDMA or SDMA can be used to enable each person to talk alternately or provide a separate room for each person when two persons desire to talk with each other at the same time, whereas FDMA can be used to enable one person to talk in soprano, whereas the other in bass (one of the two talkers can carry out synchronization for hearing in case there is a bandpass filter function in the area of the hearer).

Another method available is to make two persons to sing in different languages at the same time, space, and frequency when wishing to let the audience hear the singing without being confused. This is the characteristics of CDMA.

On the other hand, when employing the CDMA technology, each signal has a different pseudo-random binary sequence used to spread the spectrum of carrier. A great number of CDMA signals share the same frequency spectrum. In the perspective of frequency area or time area, several CDMA signals are overlapped. Among these types of signals, only desired signal energy is selected and received through the use of pre-determined binary sequence; desired signals can be separated and then, received with the correlator used for recovering the spectrum into its original state. At this time, the spectrums of other signals that have different codes are not recovered into its original state and instead, processed as noise and appears as the self-interference of the system.

2. Features and Advantages of CDMA Mobile Phone

2.1 Various Types of Diversities

When employing the narrow band modulation (30kHz band) that is the same as the analog FM modulation system used in the existing cellular system, the multi-paths of radio waves create a serious fading. However, in the CDMA broadband modulation(1.25MHz band), three types of diversities (time, frequency, and space) are used to reduce serious fading problems generated from radio channels in order to obtain high-quality calls.

Time diversity can be obtained through the use of code interleaving and error correction code whereas frequency diversity can be obtained by spreading signal energy to more wider frequency band. The fading related to normal frequency can affect the normal 200~300kHz among signal bands and accordingly, serious affect can be avoided. Moreover, space diversity (also called path diversity) can be realized with the following three types of methods.

First, it can be obtained by the duplication of cell site receive antenna. Second, it can be obtained through the use of multi-signal processing device that receives a transmit signal having each different transmission delay time and then, combines them. Third, it can be obtained through the multiple cell site connection (Soft Handoff) that connects the mobile station and more than two cell sites at the same time.

2.2 Power Control

The CDMA system utilizes the forward (from a base station to mobile stations) and backward (from the mobile station to the base station) power control in order to increase the call processing capacity and obtain high-quality calls. In case the originating signals of mobile stations are received by the cell site in the minimum call quality level (signal to interference) through the use of transmit power control on all the mobile stations, the system capacity can be maximized.

If the signal of mobile station is received too strong, the performance of that mobile station is improved. However, because of this, the interference on other mobile stations using the same channel is increased and accordingly, the call quality of other subscribers is reduced unless the maximum accommodation capacity is reduced.

In the CDMA system, forward power control, backward open loop power control, and closed loop power control methods are used. The forward power control is carried out in the cell site to reduce the transmit power on mobile stations less affected by the multi-path fading and shadow phenomenon and the interference of other cell sites when the mobile station is not engaged in the call or is relatively nearer to the corresponding cell site. This is also used to provide additional power to mobile stations having high call error rates, located in bad reception areas or far away from the cell site.

The backward open loop power control is carried out in a corresponding mobile station; the mobile station measures power received from the cell site and then, reversely increases/decreases transmit power in order to compensate channel changes caused by the forward link path loss and terrain

characteristics in relation to the mobile station in the cell site. By doing so, all the mobile office transmit signals in the cells are received by the cell site in the same strength.
Moreover, the backward closed loop power control used by the mobile station to control power with the commands issued out by the cell site. The cell site receives the signal of each corresponding mobile station and compares this with the pre-set threshold value and then, issues out power increase/decrease commands to the corresponding mobile station every 1.25 msec (800 times per second).
By doing so, the gain tolerance and the different radio propagation loss on the forward/backward link are complemented.

2.3 Voice Encoder and Variable Data Speed

The bi-directional voice service having variable data speed provides voice communication which employs voice encoder algorithm having power variable data rate between the mobile telephone cell site and mobile station. On the other hand, the transmit voice encoder performs voice sampling and then, creates encoded voice packets to be sent out to the receive voice encoder, whereas the receive voice encoder demodulates the received voice packets into voice samples.
One of the two voice encoders described in the above is selected for use depending on inputted automatic conditions and message/data; both of them utilize four-stage frames of 9600, 4800, 2400, and 1200 bits per second. In addition, this type of variable voice encoder utilizes adaptive threshold values when selecting required data rate. It is adjusted in accordance with the size of background noise and the data rate is increased to high rate only when the voice of caller is inputted.
Therefore, background noise is suppressed and high-quality voice transmission is possible under the environment experiencing serious noise. In addition, in case the caller does not talk, data transmission rate is reduced so that the transmission is carried out in low energy. This will reduce the interference on other CDMA signals and as a result, improve system performance (capacity, increased by about two times).

2.4 Protecting Call Confidentiality

CDMA signals have the function of effectively protecting call confidentiality by spreading and interleaving call information in broad bandwidth. This makes the unauthorized use of crosstalk, search receiver, and radio very hard substantially. Also included is the encryption function on various authentication and calls specified in IS-95 for the double protection of call confidentiality.

2.5 Soft Handoff

During the soft hand, the cell site already in the busy state and the cell site to be engaged in the call later participate in the call conversion. The call conversion is carried out through the original call

connection cell site, both cell sites, and then, new cell site. This method can minimize call disconnection and prevent the user from detecting the hand-off.

2.6 Frequency Re-Use and Sector Segmentation

Unlike the existing analog cellular system, the CDMA system can reuse the same frequency at the adjacent cell and accordingly, there is no need to prepare a separate frequency plan. Total interference generated on mobile station signals received from the cell site is the sum of interference generated from other mobile stations in the same cell site and interference generated from the mobile station of adjacent cell site. That is, each mobile station signal generates interference in relation to the signals of all the other mobile signals.

Total interference from all the adjacent cell sites is the ratio of interference from all the cell sites versus total interference from other mobile stations in the same cell site (about 65%). In the case of directional cell site, one cell normally uses a 120° sector antenna in order to divide the sector into three. In this case, each antenna is used only for 1/3 of mobile stations in the cell site and accordingly, interference is reduced by 1/3 on the average and the capacity that can be supported by the entire system is increased by three times.

2.7 Soft Capacity

The subscriber capacity of CDMA system is flexible depending on the relation between the number of users and service classes. For example, the system operator can increase the number of channels available for use during the busy hour despite the drop in call quality. This type of function requires 40% of normal call channels in the standby mode during the handoff support, in an effort to avoid call disconnection resulting from the lack of channels.

In addition, in the CDMA system, services and service charges are classified further into different classes so that more transmit power can be allocated to high class service users for easier call set-up; they can also be given higher priority of using hand-off function than the general users.

3. Structure and Functions of CDMA Mobile Phone

The mobile station of CDMA system is made up of a radio frequency part and logic/control (digital) part. The mobile station antenna is connected with the transmitter/receiver via a SAW duplexer filter so that it can carry out the transmit/receive function at the same time.

The transmit frequency is the 25MHz band of 824~849MHz, whereas the receive frequency is the 25MHz band of 869~894MHz. The transmit/receive frequency is separated by 45MHz. The RF signal from the antenna passes the LNA , bandpass SAW filter having the 1.25MHz band and then, is directly converted into baseband signal by the frequency synthesizer and frequency down converter. Baseband output signals that have been filtered from spurious signal are converted into digital signals via an analog-to-digital converters(Rx ADC) and then, sent out respectively to 5 correlators in each CDMA de-modulator. Of these, one is called a searcher whereas the remaining 4 are called data receiver(finger). Rx signals include a great number of call signals that have been sent out by the adjacent cells. These signals are detected with pseudo-noise sequence (PN Sequence). Signal to interference ratio (C/I) on signals that match the desired PN sequence are increased through this type of correlation detection process. Then, other signals obtain processing gain by not increasing the ratio. The carrier wave of pilot channel from the cell site most adjacently located is demodulated in order to obtain the sequence of encoded data symbols.

During the operation with one cell site, the searcher searches out multi-paths in accordance with terrain and building reflections. On three data receivers, the most powerful four paths are allocated for the parallel tracing and receiving. Fading resistance can be improved a great deal by obtaining the diversity combined output for de-modulation. Moreover, the searcher can be used to determine the most powerful path from the cell sites even during the soft handoff during the two cell sites. Moreover, four data receivers are allocated in order to carry out the de-modulation of these paths. Data output that has been demodulated change the data string in the combined data row as in the case of original signals(deinterleaving), and then, are de-modulated by the forward error correction decoder which uses the Viterbi algorithm.

On the other hand, mobile station user information sent out from the mobile station to the cell site pass through the digital voice encoder via a mike. Then, they are encoded and forward errors are corrected through the use of convolution encoder. Then, the order of code rows is changed in accordance with a certain regulation in order to remove any errors in the interleaver. Symbols made through the above process are spread after being loaded onto PN carrier waves. At this time, PN sequence is selected by each address designated in each call.

Signals that have been code spread as above are digital modulated (OQPSK) and then, power controlled at the automatic gain control amplifier (AGC Amp). Then, they are converted into RF band by the frequency synthesizer synchronizing these signals to proper output frequencies. Transmit signals obtained pass through the duplexer filter and then, are sent out to the cell site via the antenna.

4. Specification

4.1 General Specification

4.1.1 Transmit/Receive Frequency Interval : 45MHz

4.1.2 Number of Channels (Channel Bandwidth) : 20CH (BW : 1.23MHz)

4.1.3 Operating Voltage : DC 3.2~4.2V

4.1.4 Battery Power Consumption : DC 3.7V

	SLEEP	IDLE	MAX POWER
CDMA	1.2 mA	80 ~ 100 mA	580 mA (25dBm)

4.1.5 Operating Temperature : -30° ~ +60°

4.1.6 Frequency Stability : ±0.5PPM

4.1.7 Antenna : Fixed PIFA Type (Internal), 50 Ω

4.1.8 Size and Weight

- Size : 105.7 x 44 x 16.5mm (L x W x D)
- Weight : 70g(TBD)

4.1.9 Channel Spacing : 1.25MHz

4.1.10 Battery Type, Capacity and Orerating Time

Unit = Hours, Minutes

	Standard (950mAh)
Stand-By Time	140 Hrs (SCI=2)
Talk Time	145 Min (Cell power -92dBm)

4.2 Receive Specification

4.2.1 Frequency Range : 869.820 MHz ~ 893.190 MHz

4.2.2 Local Oscillating Frequency Range : 1738.08MHz ~ 1787.94MHz

4.2.3 Intermediate Frequency : QSC60X0 seires (Zero IF)

4.2.4 Sensitivity : -104dBm (C/N 12dB or more)

4.2.5 Selectivity : 3dB C/N Degration (With Fch ± 1.25KHz : -30dBm)

4.2.6 Spurious Wave Suppression : Maximum of -80dB

4.2.7 CDMA Input Signal Range

- Dynamic area of more than -115~ -12.6 dB : 102.4dB at the 1.23MHz band

4.3 Transmit Specification

4.3.1 Frequency Range : 824.820 MHz ~ 848.190 MHz

4.3.2 Intermediate Frequency : QSC60X0 seires (Zero IF)

4.3.3 Output Power : 0.282W

4.3.4 Interference Rejection

- Single Tone : -30dBm at 900 kHz
- Two Tone : -43dBm at 900 kHz & 1700kHz

4.3.5 CDMA TX Frequency Deviation : ±300Hz or less

4.3.6 CDMA TX Conducted Spurious Emissions

- 900kHz : - 42 dBc/30kHz below
- 1.98MHz : - 54 dBc/30kHz below

4.3.7 CDMA Minimum TX Power Control : - 50dBm below

4.4 MS (Mobile Station) Transmitter Frequency

FA NO.	CH.NO.	CENTER FREQUENCY	FA NO.	CH.NO.	CENTER FREQUENCY
1	1011	824.640 MHz	11	404	837.120 MHz
2	29	825.870 MHz	12	445	838.350 MHz
3	70	827.100 MHz	13	486	839.580 MHz
4	111	828.330 MHz	14	527	840.810 MHz
5	152	829.560 MHz	15	568	842.04 MHz
6	193	830.790 MHz	16	609	843.270 MHz
7	234	832.020 MHz	17	650	844.500 MHz
8	275	833.250 MHz	18	697	845.910 MHz
9	316	834.480 MHz	19	738	847.140 MHz
10	363	835.890 MHz	20	779	848.370 MHz

4.5 MS (Mobile Station) Receiver Frequency

FA NO.	CH.NO.	CENTER FREQUENCY	FA NO.	CH.NO.	CENTER FREQUENCY
1	1011	869.640 MHz	11	404	882.120 MHz
2	29	870.870 MHz	12	445	883.350 MHz
3	70	872.100 MHz	13	486	884.580 MHz
4	111	873.330 MHz	14	527	885.810 MHz
5	152	874.560 MHz	15	568	887.04 MHz
6	193	875.790 MHz	16	609	888.270 MHz
7	234	877.020 MHz	17	650	889.500 MHz
8	275	878.250 MHz	18	697	890.910 MHz
9	316	879.480 MHz	19	738	892.140 MHz
10	363	880.890 MHz	20	779	893.370 MHz

4.6 Charge time

4.6.1 Standard Battery : 200 Min.

5. Installation

5.1 Installing a Battery Pack (Soft Pack type)

1) The soft battery pack is keyed so it can only fit one way. Align the groove in the battery pack with the rail on the back of the phone until the battery pack rests flush with the back of the phone.
2) Insert the bottom of battery into the openning on the back of the phone. Then, push the battery cover up until the latch clicks.

5.2 For Adapter Use

1) Plug the adapter into a wall outlet. The adapter can be operated from either a 110V or a 220V source.
2) Insert the adapter jack into the phone with the installed battery pack.
   Red light indicates battery is being charged. Green light indicates battry is fully charged

5.3 For Mobile Mount

5.3.1 Installation Position

In order to reduce echo sound when using the Hands-Free Kit, make sure that the speaker and microphone are not facing each other and keep microphone a generous distance from the speaker.

5.3.2 Cable Connections

5.3.2.1 Power and Ignition Cables

Connect the red wire to the car battery positive terminal and the black wire to the car ground. Connect the green wire to the car ignition sensor terminal. (In order to operate HFK please make sure to connect green wire to ignition sensor terminal.) Connect the kit's power cable connector to the interface box power receptacle.

5.3.2.2 Antenna Cable Connection

Connect the antenna coupler cable connector from the cradle to the external antenna connector. (Antenna is not included.)

CHAPTER 2. Circuit Description

1. RF Transmit/Receive Part

1.1 Overview

The RF transmit/receive part employs the direct conversion architecture (ZIF, Zero Intermediate Frequency). The transmit/receive frequency is respectively 824.04~848.97MHz and 869.04~893.97 MHz. The block diagram is shown in [Figure 3-1].

RF signals received through the antenna are fed QSC6010 through the duplexer. And then, they pass the low noise amplifier (LNA), combined with the signals of local oscillator (VCO) at the frequency mixer in order to create baseband signal directly.

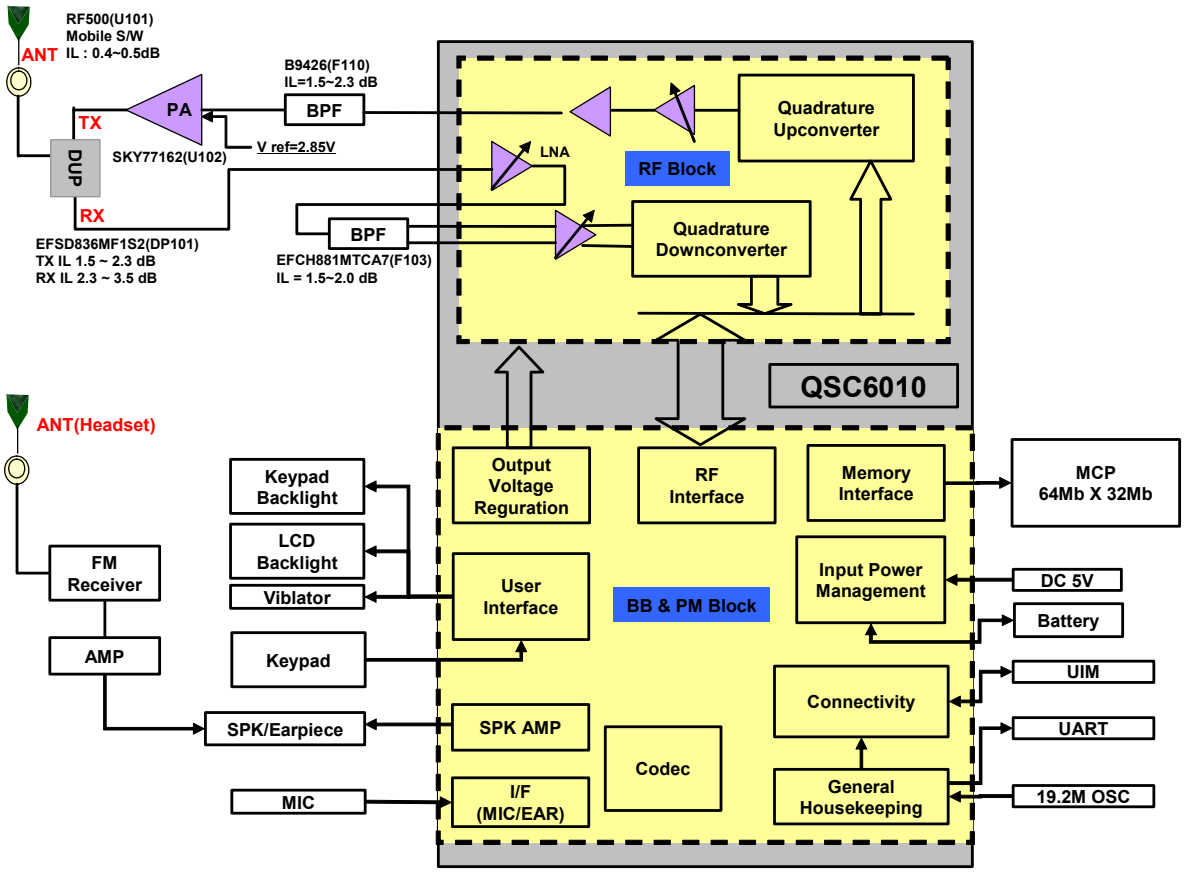
Baseband signals created are changed into digital signals by the analog / digital converter (ADC, A/D Converter) and then, auto gain controlled and, are demodulated by the modulator / demodulator.

In the case of transmission, QSC6010 modulates, interpolates, and converts the digital signal into an analog baseband before upconverts the Tx analog baseband into RF.

The baseband quadrature signals are upconverted to the Cellular Tx frequency bands and amplified to provide signal drive capability to the power amp.

After that, the RF signal is amplified by the Power Amp in order to have enough power for radiation. Finally, the RF signal is sent out to the cell site via the antenna after going through the duplexer

[Figure 2-1] Block Diagram Of ID3100



1.2 Description of Receive Part Circuit

1.2.1 Duplexer (DP101)

The duplexer consists of the receive part bandpass filter (BPF) and the transmit part bandpass filter (BPF) which have the function of separating transmit/receive signals in the full duplex system using the transmit/receive common antenna. The transmit part BPF is used to suppress noises and spurious waves entering the receive band among transmit signals in order to prevent the drop in receive sensitivity characteristics. The receive part BPF blocks the signals sent out from entering the receive end in order to improve sensitivity characteristics.

Insertion loss (IL) in the transmit band is 2.8dB (Max), whereas IL in the receive band is 3.5dB (Max). The receive band attenuation amount of transmit filter is 45dB (Min) and the transmit band attenuation amount of receive filter is 57dB or more (Min).

1.2.2 Rx RF SAW FILTER (F101)

The main function of Rx RF SAW filter is to attenuate mobile phone spurious frequency, attenuate noise amplified by the LNA and suppress second harmonic originating in the LNA.

1.2.3 Down-Converter Mixers (U201)

The QSC6010 device performs signal direct-down-conversion for Cellular applications. It contains all the circuitry (with the exception of external filters) needed to support conversion of received RF signals to baseband signals. The LO Buffer Amplifier buffers the RF VCO to the RF Transmit Upconverter. QSC6010 offers the most advanced and integrated CDMA Rx solution designed to meet cascaded Noise Figure (NF) and Third-order Intercept Point (IIP3) requirements of IS-98C and J-STD-018 specifications for Sensitivity, Two-Tone Intermodulation, and Single-tone Desense.
Operation modes and band selection are specially controlled from the Mobile Station Modem QSC6010.

1.3 Description of Transmit Part Circuit

1.3.1 Description on the Internal Circuit of QSC6010(U201)

For the transmit data path(Tx), the QSC6010 modulates, interpolates, and converts the digital signal into an analog baseband, and upconverts the Tx analog baseband into RF. The QSC6010 communicates with the external RF and analog baseband to control signal gain in the RF Rx and Tx signal paths, educe base band offset errors, and tune the system frequency reference.

The QSC6010 baseband-to-RF Transmit Processor performs all Tx signal-processing functions required between digital baseband and the Power Amplifier Module (PAM). The baseband quadrature signals are upconverted to the Cellular frequency bands and amplified to provide signal drive capability to the PAM. The QSC6010 includes an mixer for up-converting analog baseband to RF, a programmable PLL for generating Tx and Rx LO frequency, cellular driver amplifier and Tx power control. As added benefit, the single sideband upconversion eliminates the need for a band-pass filter normally required between the upconverter and driver amplifier.
I, I/, Q and Q/ signals are modulated by Offset Quadrature Phase Shift King (OQPSK). I and Q are 90 deg. out of phase, and I and I/ are 180 deg. The mixer in QSC6010 converts baseband signals into RF signals. After passing through the upconverters, RF signal is inputted into the Power Amplifier Module.
The QSC6010 Cellular CDMA RF specifications are described below:

	Condition	Min.	Typ.	Max.	Unit
Maximum Output Power		28			dBm
Noise power	869-894 MHz, all power levels			-135.0	dBm/Hz
ACPR	±885kHz, < 2:1 VSWR ±1.98MHz, < 2:1 VSWR			-44 -57	dBc dBc

1.3.2 Power Amplifier (U102)

The power amplifier that can be used in the CDMA mode has linear amplification capability.
For higher efficiency, it is made up of one module (Monolithic Microwave Integrated Circuit) for which RF input terminal and internal interface circuit are integrated onto one IC after going through the GaAs HBT (heterojunction bipolar transistor) process.
The module of power amplifier is made up of an output end interface circuit including this module.
The maximum power that can be inputted through the input terminal is 8dBm and conversion gain is about 28.5dB. RF transmit signals that have been amplified through the power amplifier are sent to the duplexer.

1.4 Description of Frequency Synthesizer Circuit

1.4.1 Crystal Oscillator (X202)

Crystal Unit generates the refrence frequency of 19.2MHz. Tolerance at 25◦C is $\pm 12x10^{-6}$ Max.Tolerance over the tmperature range is $\pm 12x10^{-6}$ Max. at -30 to 85◦C

2. Digital/Voice Processing Part

2.1 Overview

The digital/voice processing part processes the user's commands and processes all the digital and voice signal processing in order to operate in the phone. The digital/voice processing part is made up of a keypad/LCD, receptacle part, voice processing part, mobile station modem part, memory part, and power supply part.

2.2 Configuration

2.2.1 Keypad/LCD and Receptacle Part

This is used to transmit keypad signals to QSC6010. It is made up of a keypad backlight part that illuminates the keypad, LCD part that displays the operation status on to the screen, and a receptacle that receives and sends out voice and data with external sources.

2.2.2 Voice Processing Part

The voice processing part is made up of an audio codec in QSC6010 used to convert MIC signals into digital voice signals and other external MIDI Synthesizer used to convert digital voice signals into analog voice signals, amplifying parts for amplifying the voice signals and MIC signals are on external MIDI Synthesizer and Codec in QSC6010.

2.2.3 QSC6010 (Mobile Station Modem) Part

QSC6010 is the core elements of a CDMA mobile station and carries out the functions of CPU, encoder, interleaver, deinterleaver, Viterbi decoder, Mod/Demod, codec, and vocoder.with RF, and PA module

2.2.4 Memory Part

The memory part is made up of a flash memory, SRAM for storing data.

2.3 Circuit Description

2.3.1 Keypad/LCD and Receptacle Part

Once the keypad is pressed, the key signals are sent out to QSC6010 for processing. In addition, when the key is pressed, the keypad lights up through the use of 8 LEDs and LCD backlights up. The status and operation of a mobile station are displayed on the screen for the user with the characters and icons on the LCD.
Receptacle(CON404) exchanges audio signals and data with external sources and external power.
Battery Connector receives power from the battery.

2.3.2 QSC Part

The baseband circuits and system software incorporate a low-power, high-performance RISC microprocessor core featuring the ARM926EJ-S™ CPU and Jazelle™ accelerator circuit from ARM® Limited. There are two low-power, high-performance QDSP4000™ digital signal processor (DSP) cores, one for the modem and one for applications. Camera functions are supported by the QSC6030 device only, and MIDI and MP3 functions are supported by the various QSC tiers as indicated in Table 1-2.
The baseband function reduces part costs by using two external bus interfaces to support next-generation memory architectures such as NAND FLASH, SRAM and pseudo SRAM (PSRAM), page and burst mode NOR or MLC NOR FLASH. The EBI2 also serves as an enhanced LCD interface.
A variety of connectivity options are supported: the keypad interface and USB, UART, and RUIM ports are available.
A camera interface is provided; this feature is available in the QSC6030 device only (not the QSC6020 or QSC6010 devices).
Audio support supplements the analog/RF function's CODEC, including up to 32- polyphonic MIDI in the QSC6010 device, MP3, AAC and AAC+ decoding support in the QSC6020 and QSC6030 devices and additionally a Compact Media Extension (CMX™)/MIDI synthesizer, and QCELP®.
The CDMA air interfaces mentioned earlier are implemented on the baseband CDMA processor. All necessary interfaces to the RF functions are provided, some using a portion of the 57 GPIOs. Many of the AMSS-configurable GPIOs are available for alternate uses as desired by the wireless product designers.
Support circuitry and baseband internal functions include security, clock generation and distribution, JTAG/ETM test interfaces, mode and reset controls, and the Q-fuse.

2.3.2.1 Audio Processing Part

MIC signals are inputted into the audio codec, and amplified with programmable gain, and converted into digital signals(PCM). Then, they are inputted into QSC6010.
In addition, digital audio signals(PCM) outputted from QSC6010 are converted into analog signals after going through the audio codec. These signals are amplified with programmable gain on codec's internal AMP and external MIDI Synthesizer, transferred to the ear-piece.

2.3.3 Memory Part

The memory part consists of a 64Mbits Flash Memory and a 32Mbits SRAM. On the Flash Memory, there are programs used for the operation of a mobile station and the non-volatile data of the mobile station such as a ESN(Electronic Serial Number) are stored. The programs can be changed through down loading after the assembling of mobile stations. On the SRAM, data generated during the operation of a mobile station are stored temporarily.

2.3.4 Power Supply Part

When the battery voltage (+4.2V) is fed and the PWR key of keypad is pressed, the power-up circuitry in QSC6010(U201) is activated by the PWR_ON_SW/ signal, and then the LDO regulators embedded in QSC6010 are operated and +2.80V_MSMC, +2.85V_MSMP and +2.6V_MSMA are generated.

2.3.5 Logic Part

The Logic part consists of internal CPU of QSC6010, MCP (SRAM+FLASH ROOM).
The QSC6010 receives X-tal(19.20MHz) clock signals, and then controls the phone during the CDMA mode. The major components are as follows:

CPU : ARM926EJ-S microprocessor core
MEMORY :

- FLASH ROM : 64Mbits (U301, PF38F2040W0YBQ0)
- STATIC RAM : 32Mbits (U301, PF38F2040W0YBQ0)

CPU

The ARM7TDMI 32-bit microprocessor is used and CPU controls all the circuitry. Some of the features of the ARM microprocessor include a 3 stage pipelined RISC architecture, both 32-bit ARM and 16-bit THUMB instruction sets, a 32-bit address bus, and a 32-bit internal data bus. It has a high performance and low power consumption.

FLASH ROM and SRAM

Flash Memory is used to store the program of the mobile station. Using the down-loading program, the program can be changed even after the mobile station is fully assembled.
SRAM is used to store the internal flag information, call processing data, and timer data.

KEYPAD

For key recognition, key matrix is setup using KEY_SENSE[0]-[4] signals and GPIO of output ports of QSC6010. 8 LEDs and backlight circuitry are included in the keypad for easy operation in the dark.

LCD MODULE

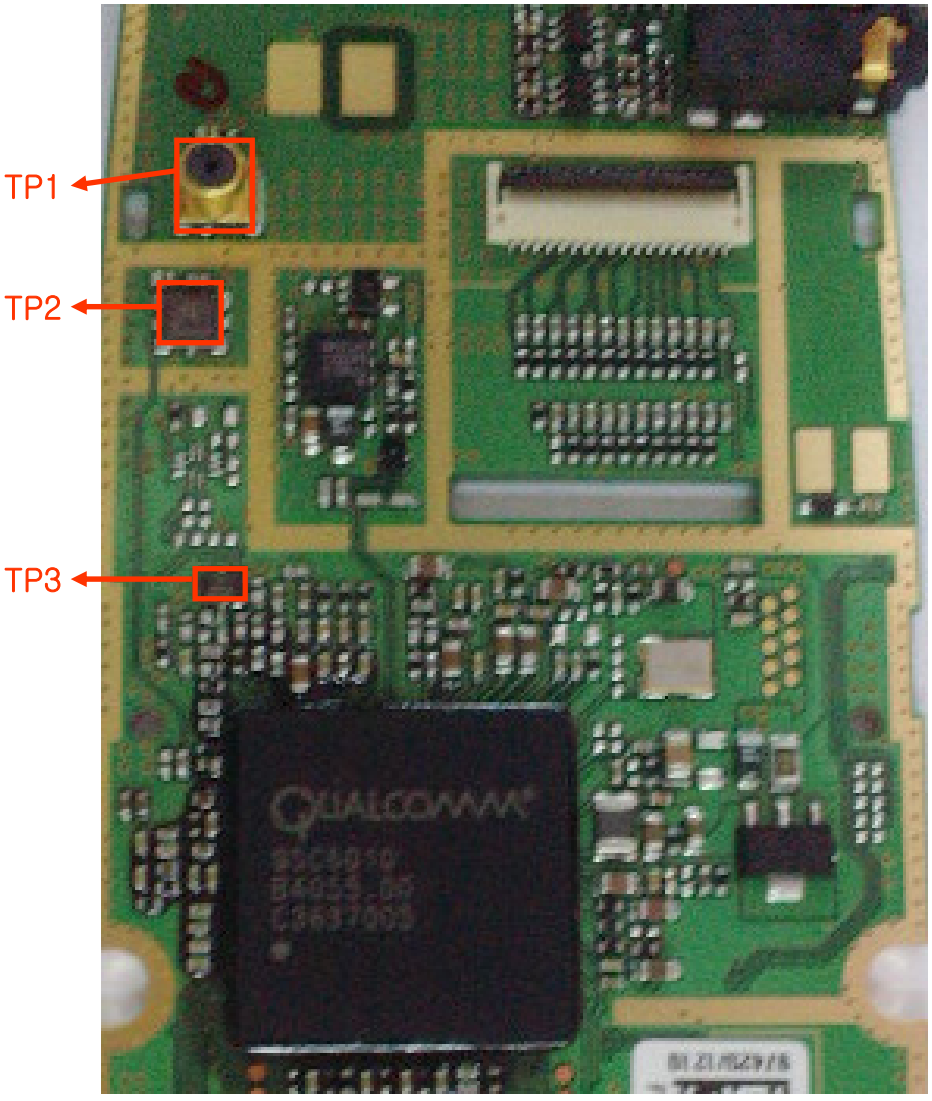
LCD module contains a controller which will display the information onto the LCD by 16-bit data from the QSC6010. It is also supplied stable 1.8V_MSM_E1 by inner regulator in U201 for fine view angle and and LCD reflects to improve the display efficiency.

CHAPTER 3. Trouble Shooting

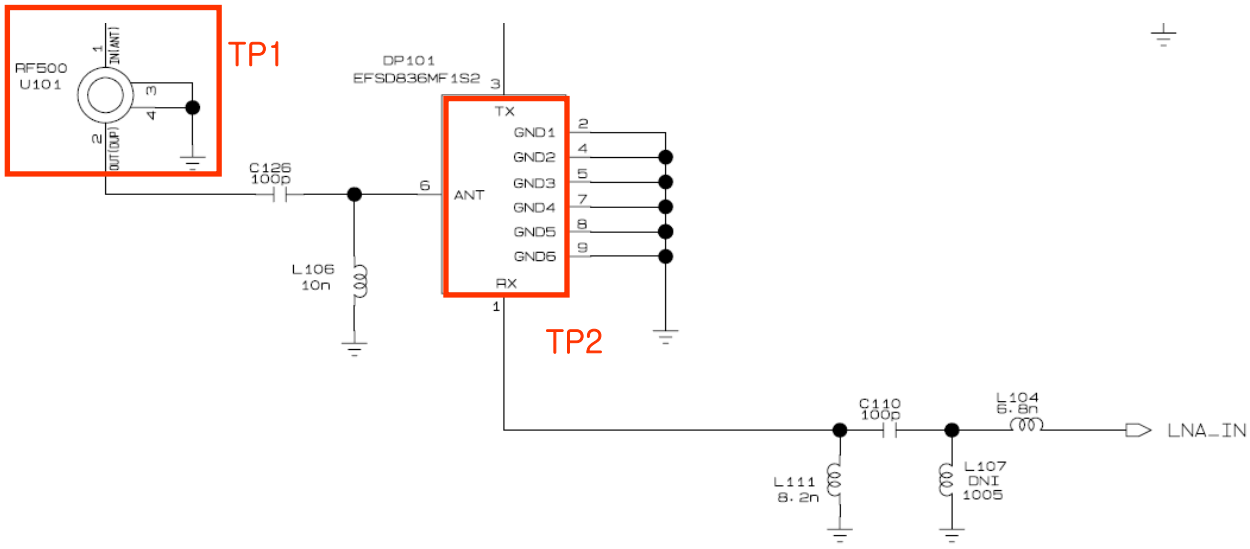
3.1 Rx Part Trouble

When Rx Sensitivity isn't good enough

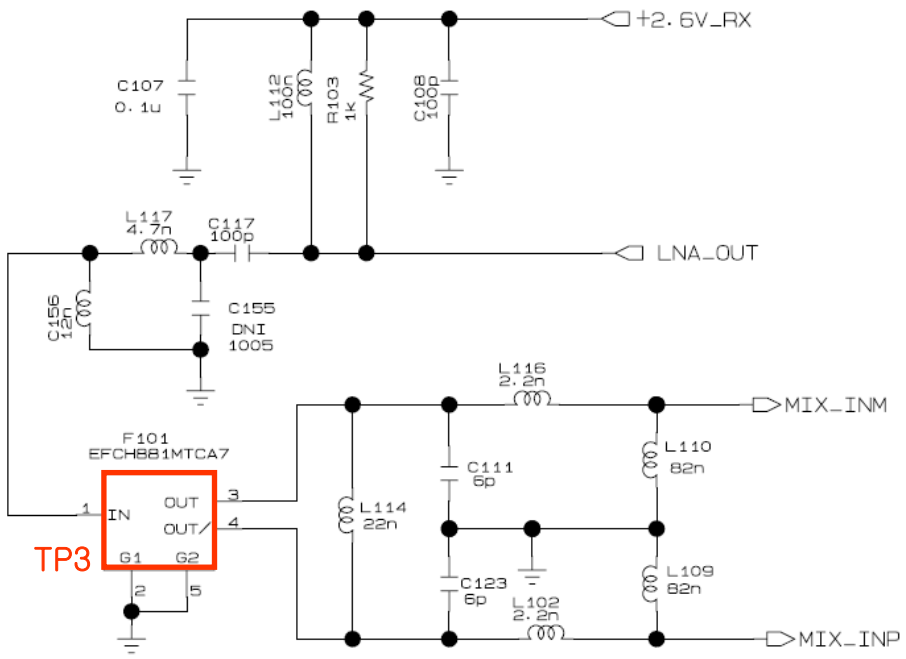
Test Point



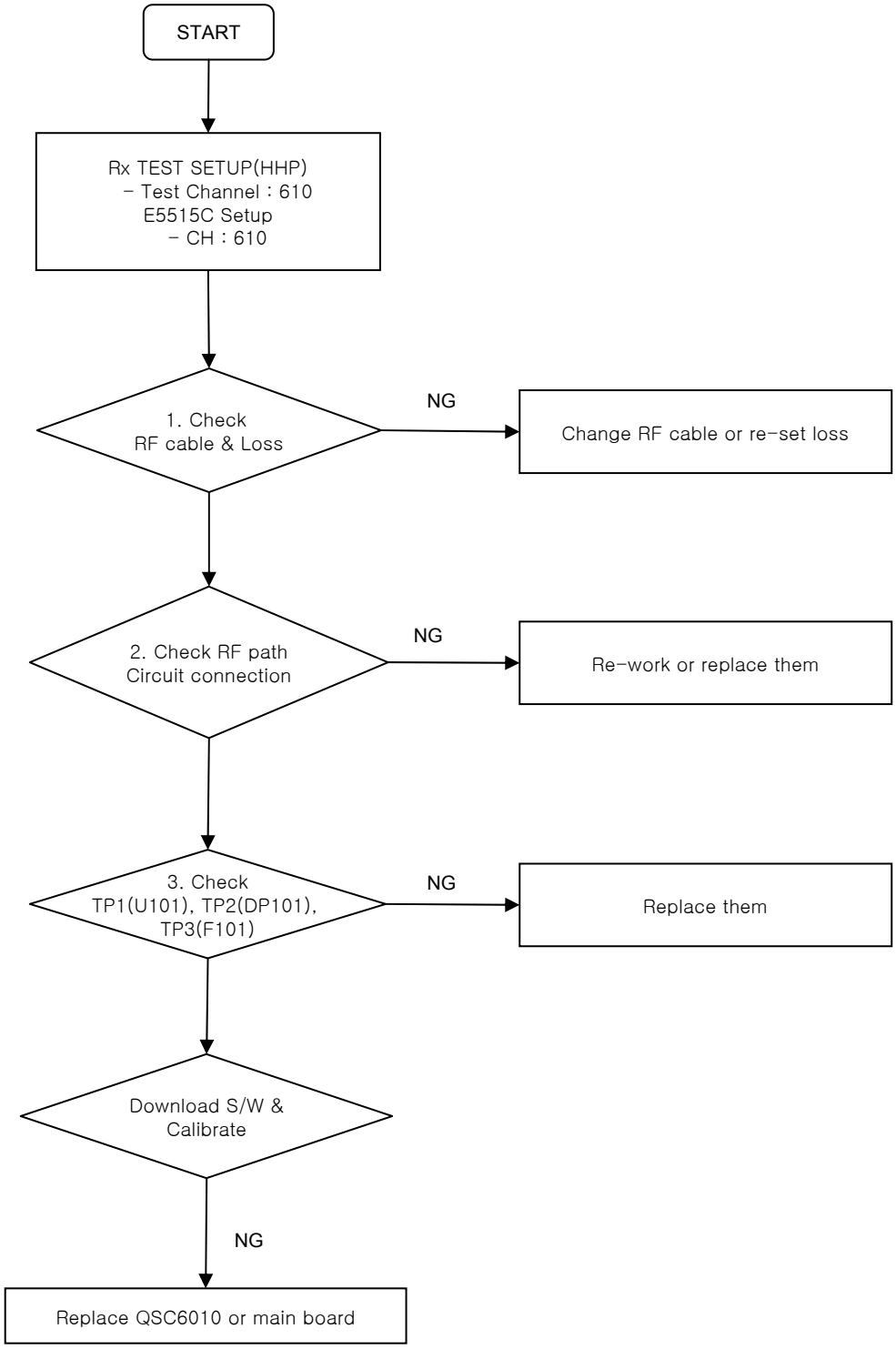
Circuit Diagram



<RF Rx PATH>

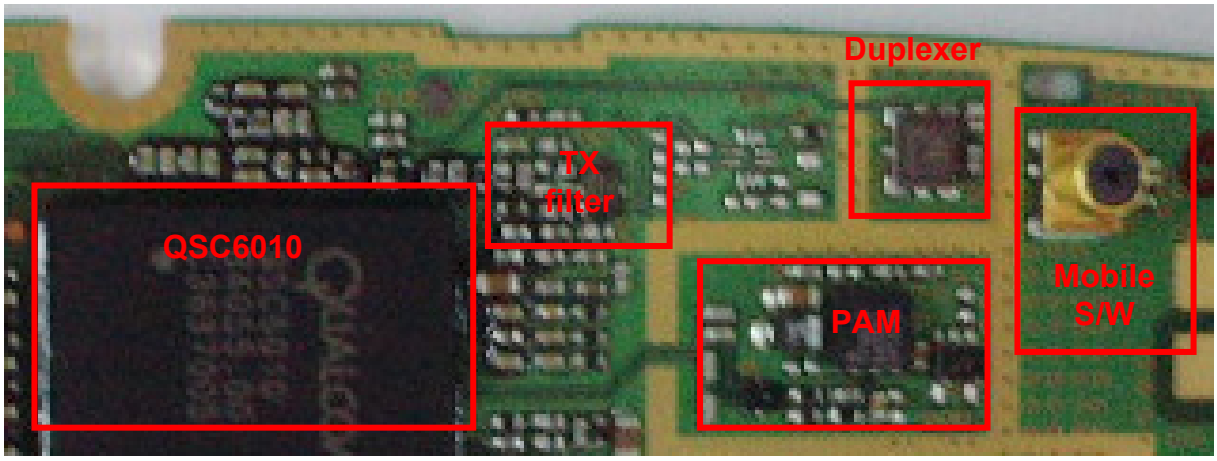


Checking Flow

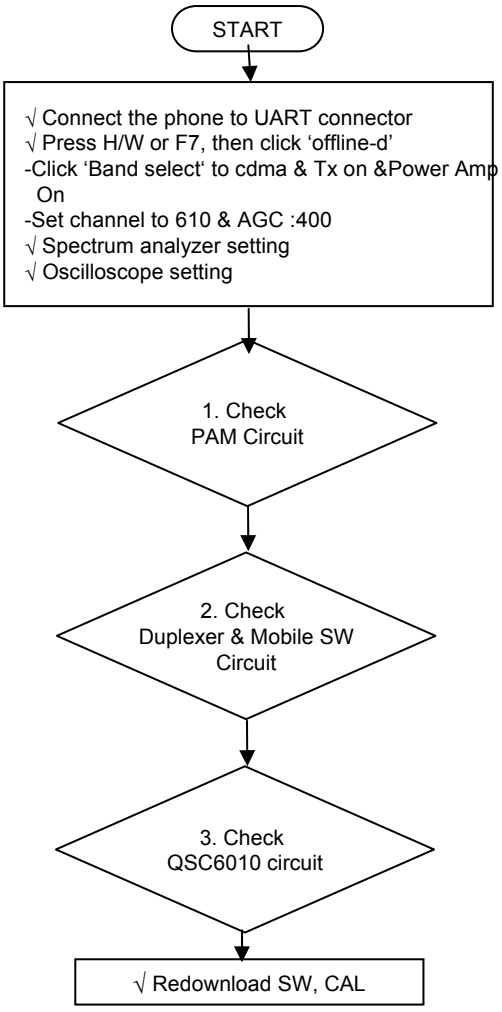


3.2 Tx part Trouble

Test Point

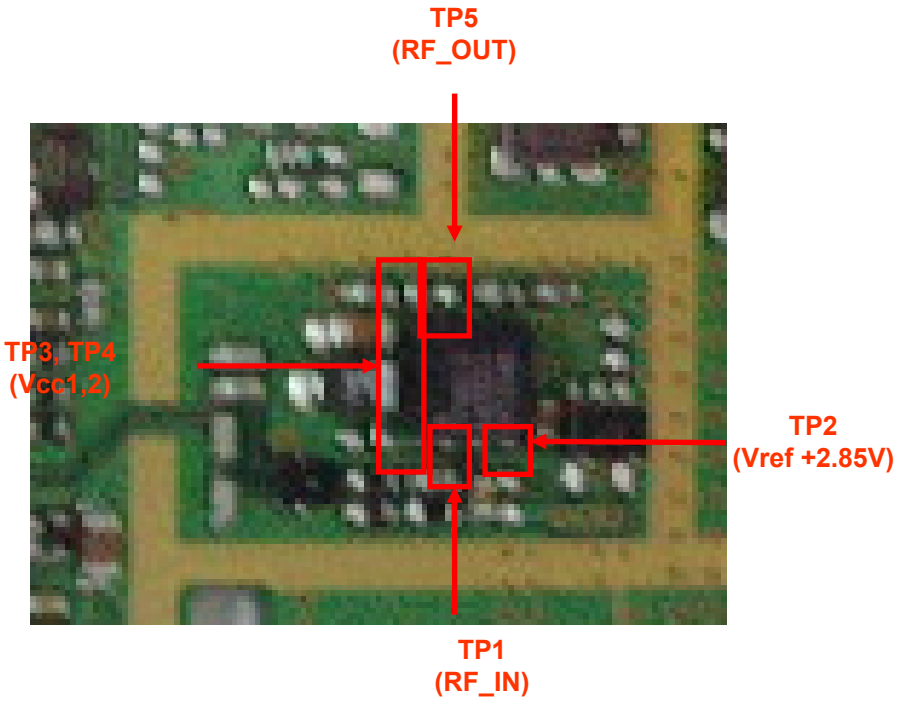


Checking Flow

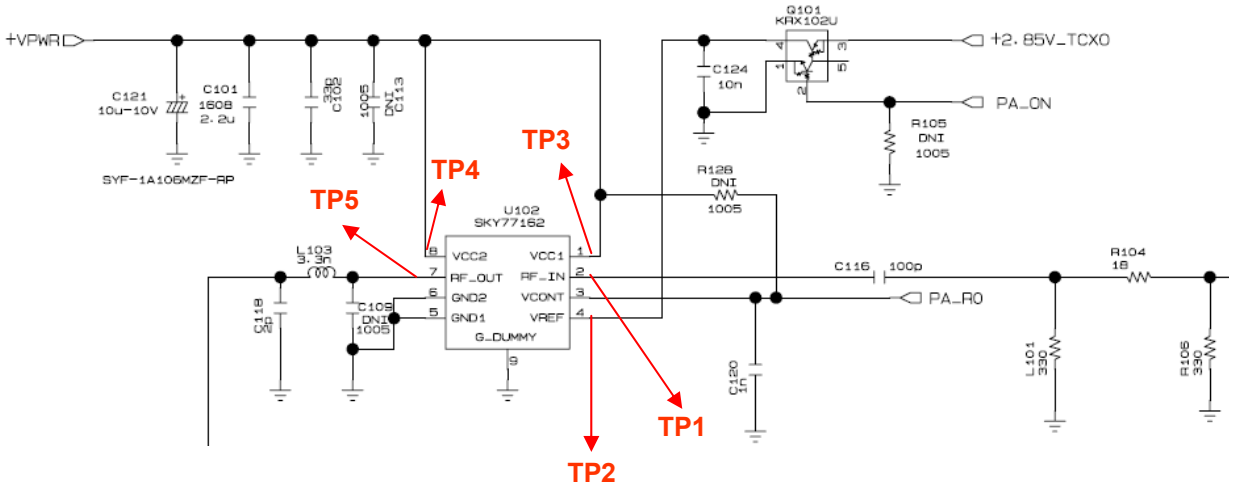


3.2.1 Check PAM Circuit

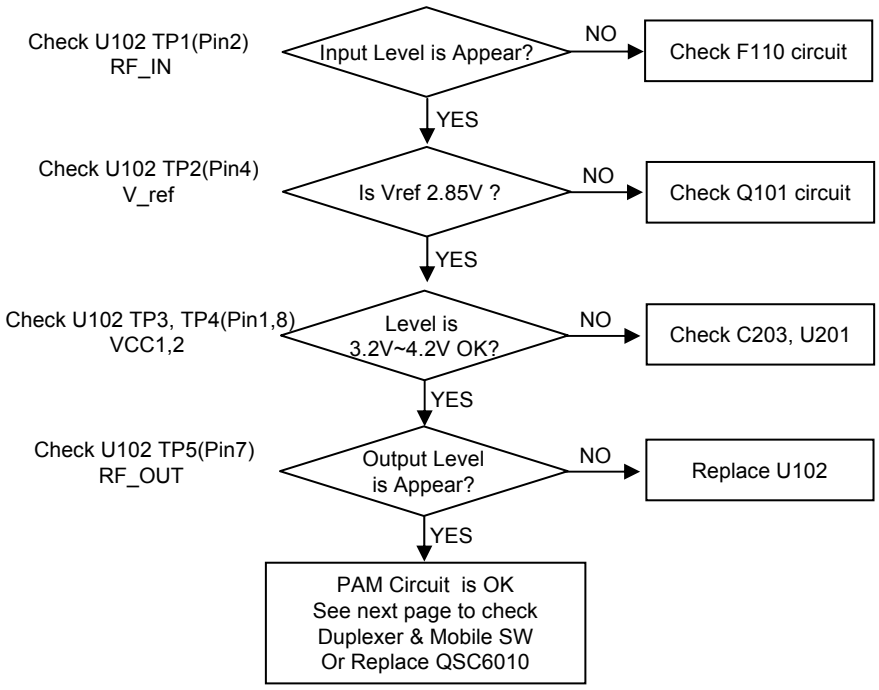
Test Point



Circuit Diagram

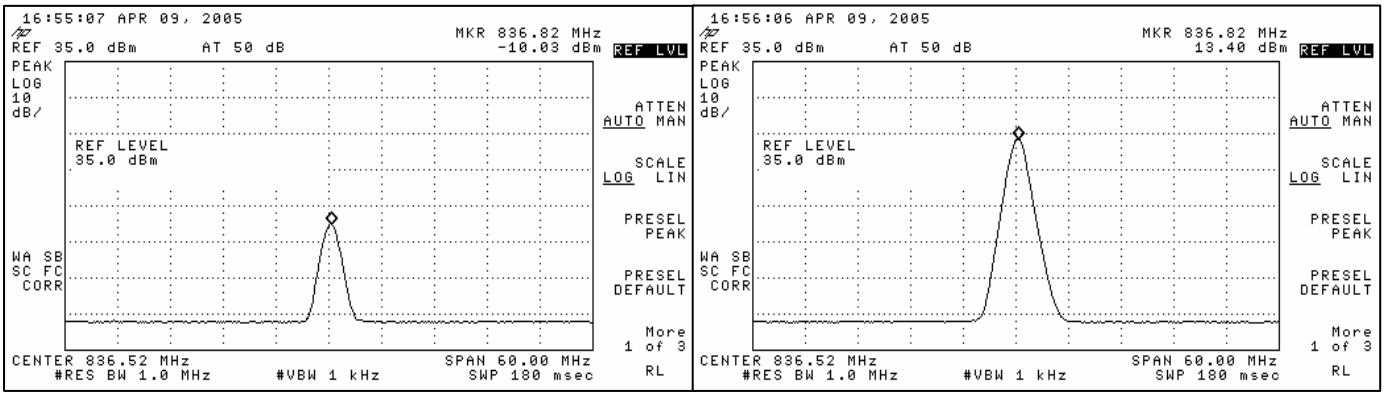


Circuit Flow



Waveform

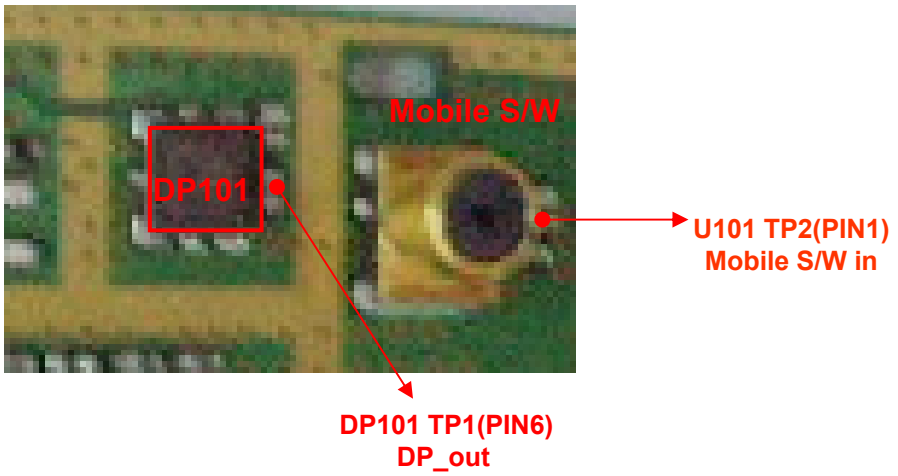
SPECTRUM ANALYZER CONDITION
-RBW : 1MHz,VBW: 1KHz
-Span : 60MHz
-Frequency : DCN(836.52MHz)



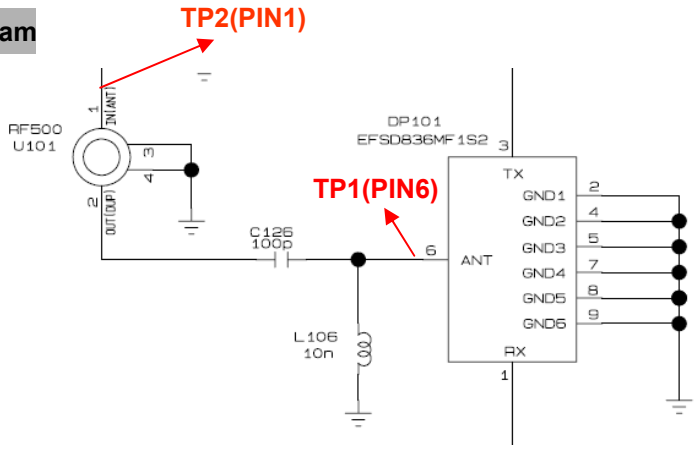
U102 Pin2 DCN PAM_IN **U102 Pin7 DCN PAM_OUT**

3.2.2 Check Duplexer & Mobile SW

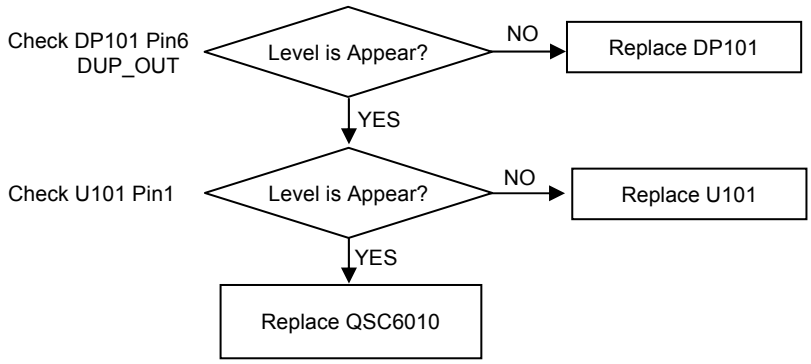
TEST POINT



Circuit Diagram



Circuit Flow



3.3 Logic Part Trouble

3.3.1 Power On Trouble

Circuit Diagram

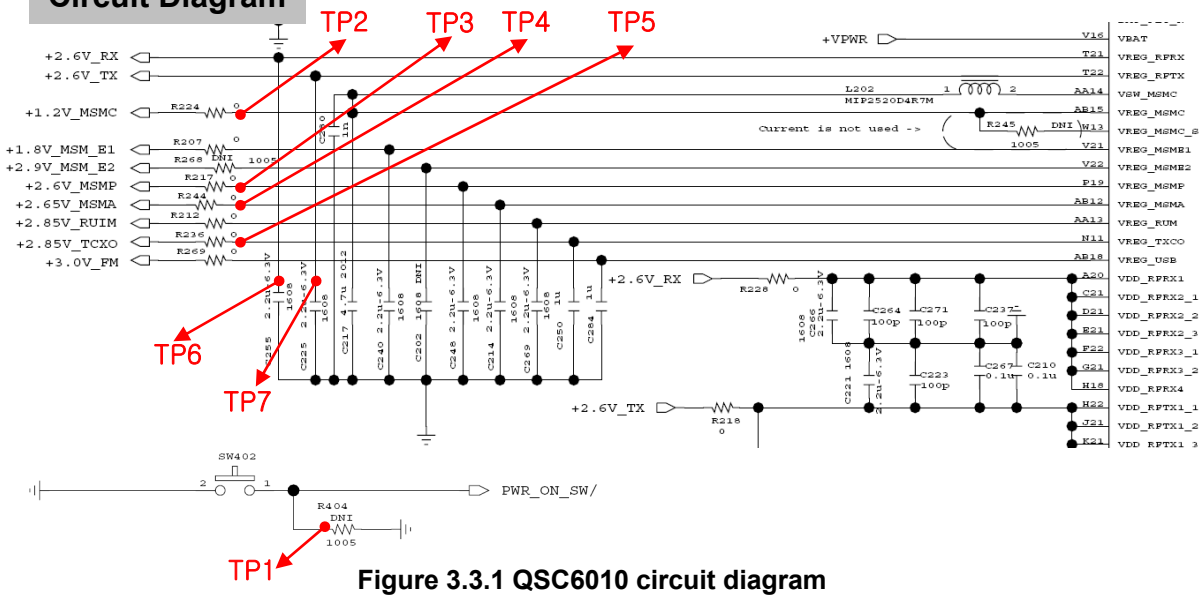
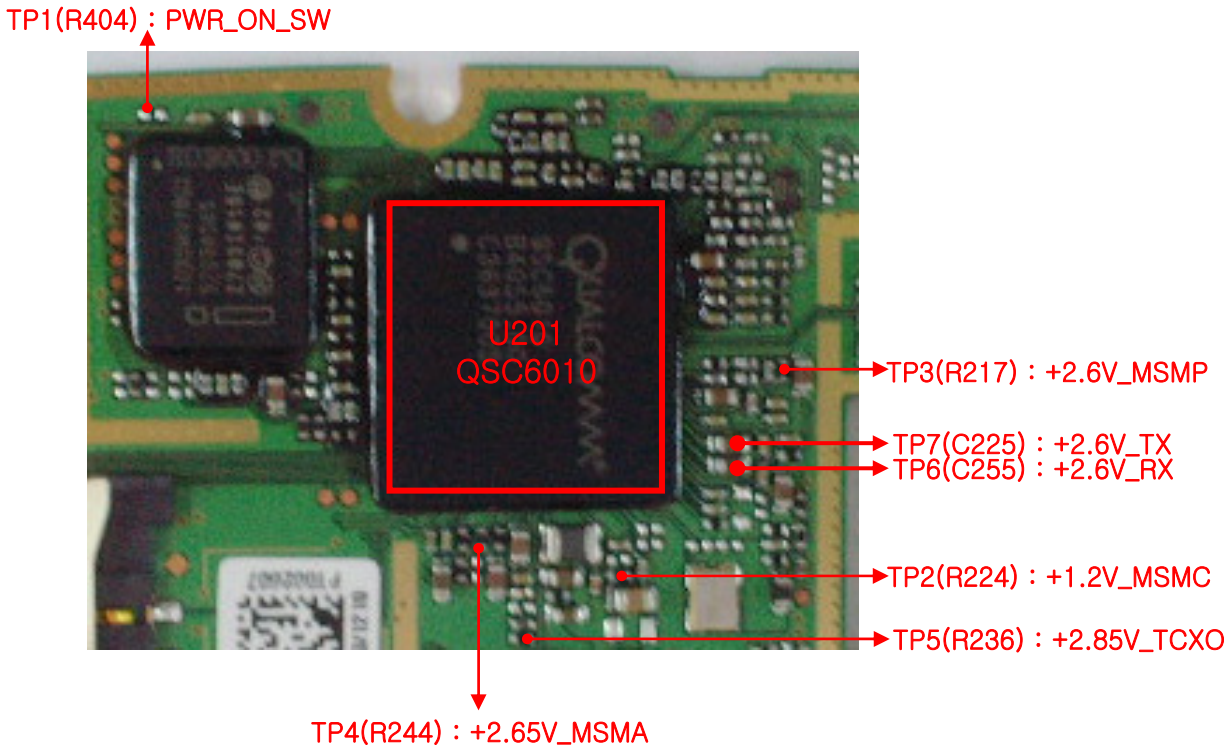
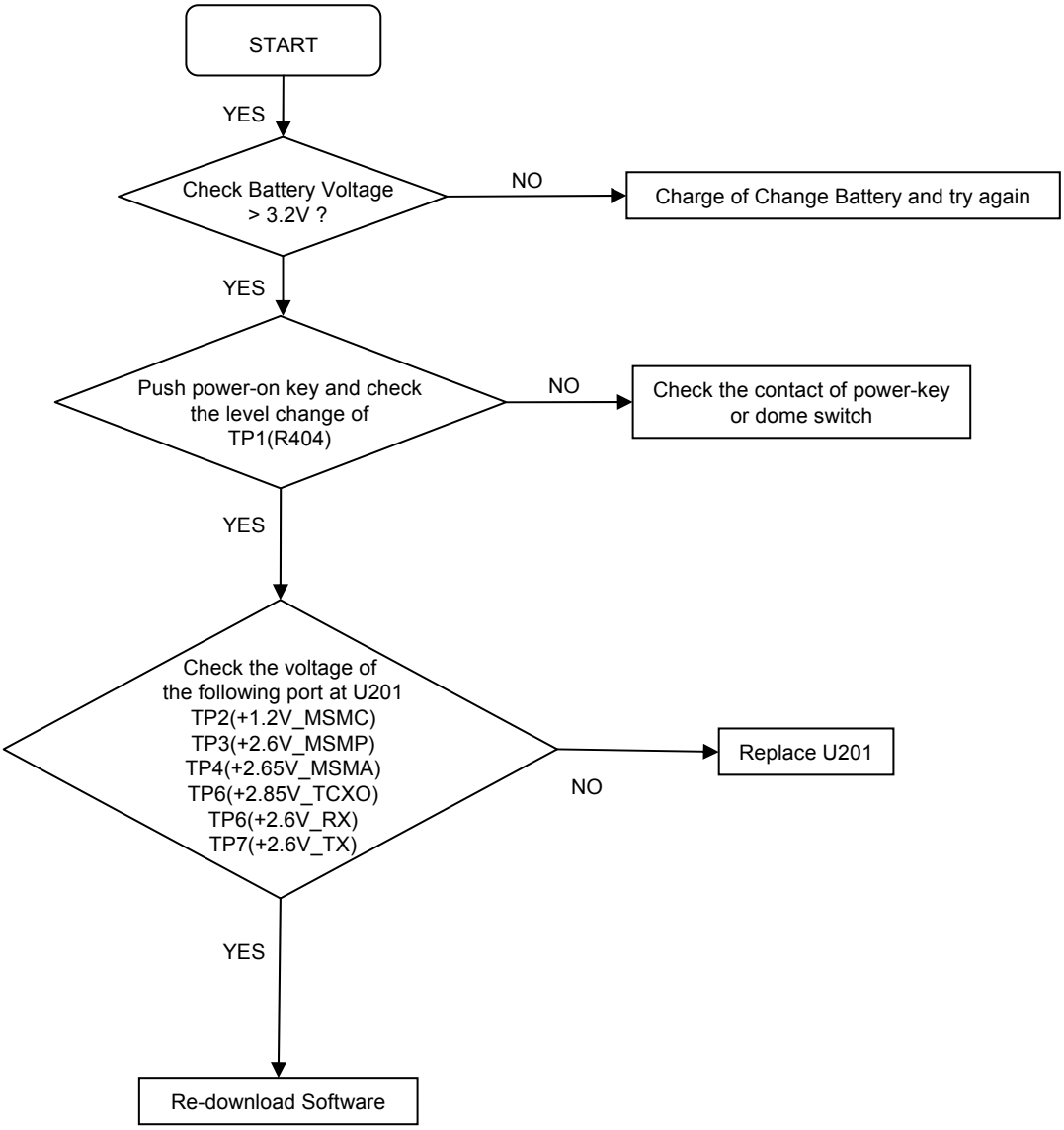


Figure 3.3.1 QSC6010 circuit diagram

Test Points



Checking Flow



3.3.2 Charging Trouble

Test Points

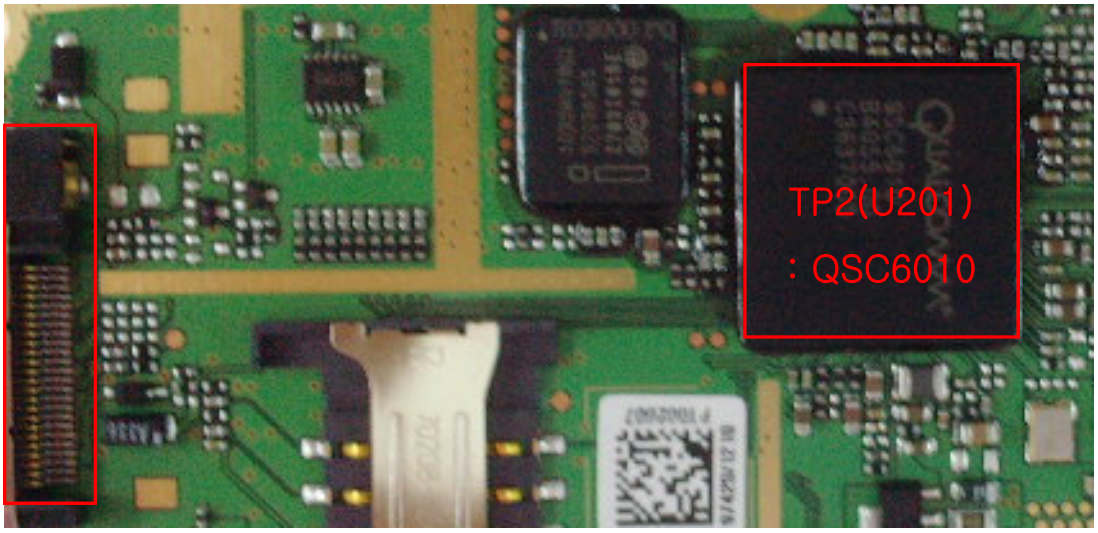
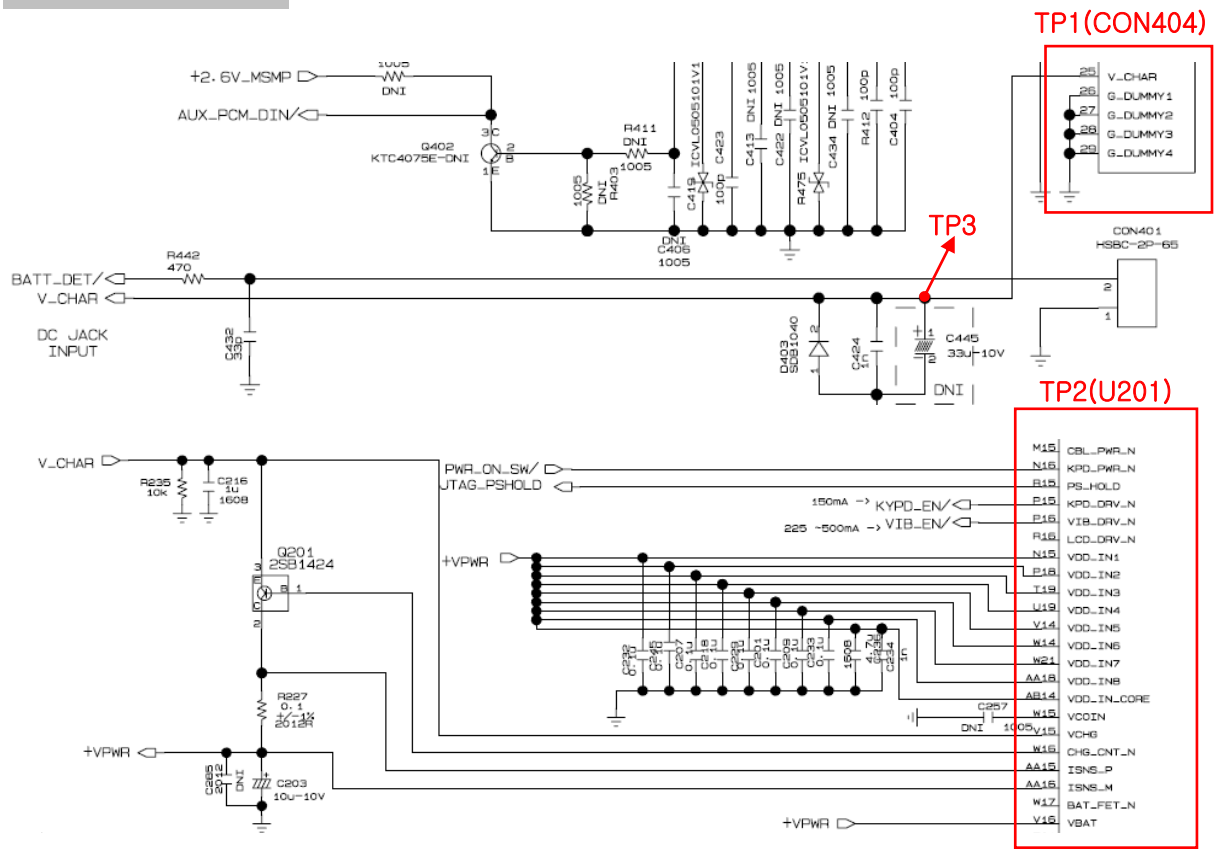


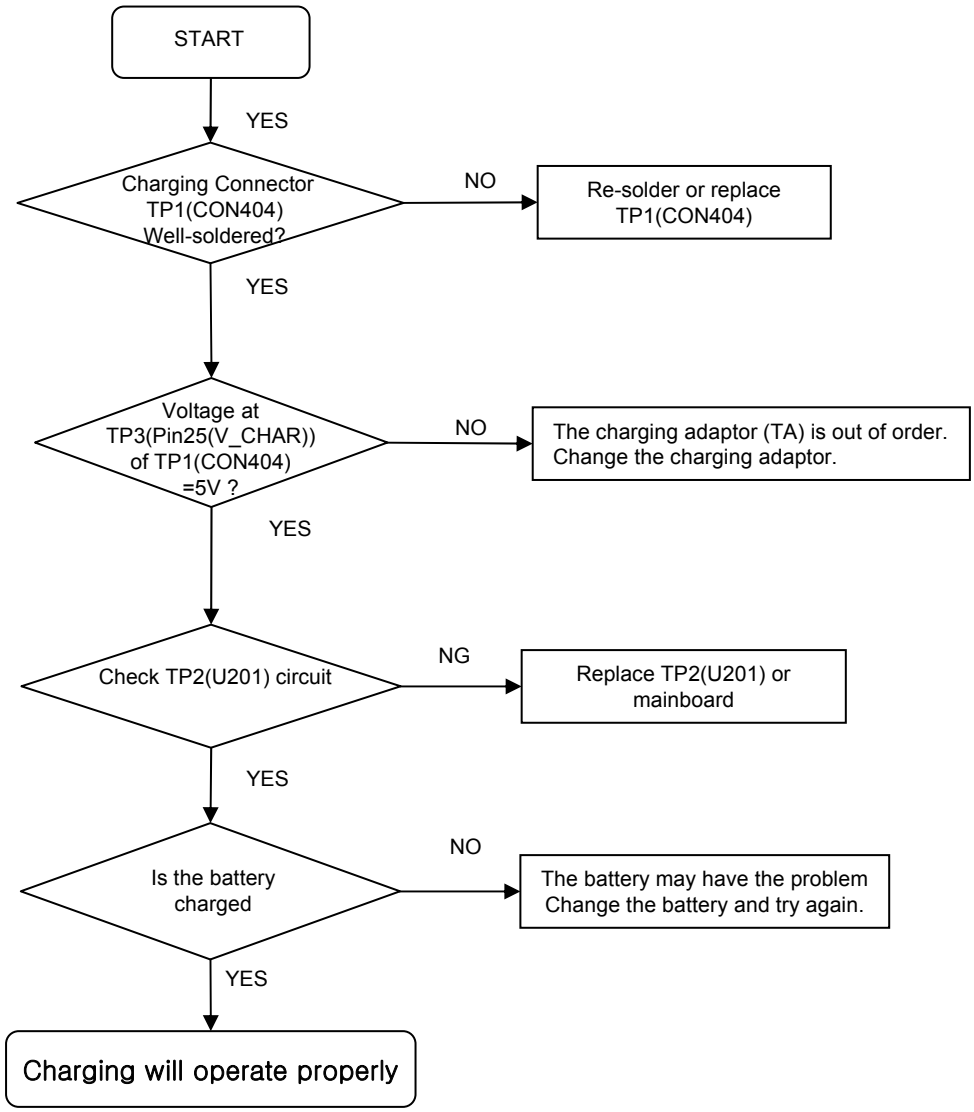
Figure 3.3.2 Charging PART

Circuit Diagram



Checking Flow

SETTING : Connect the battery and the charging adaptor (TA) to the phone



3.3.3 Audio AMP Trouble

Test Points

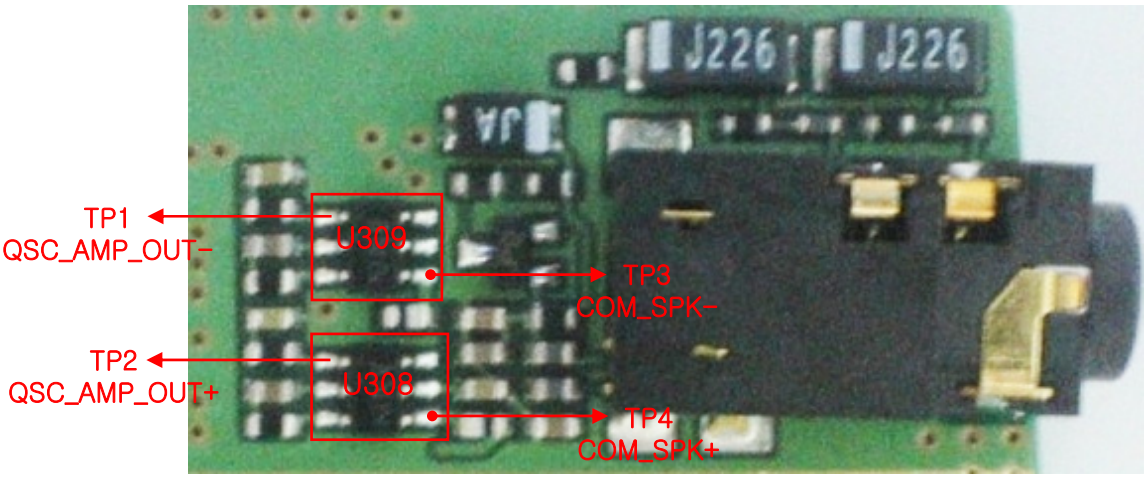
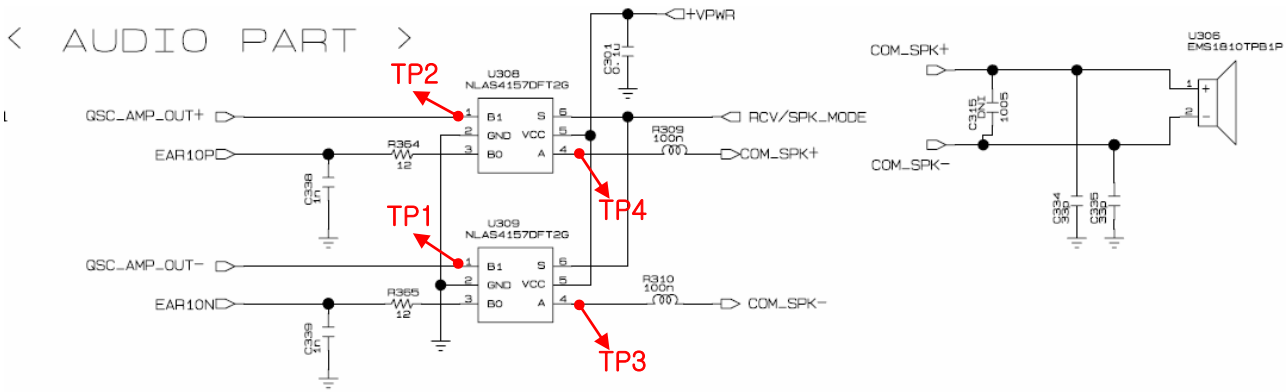


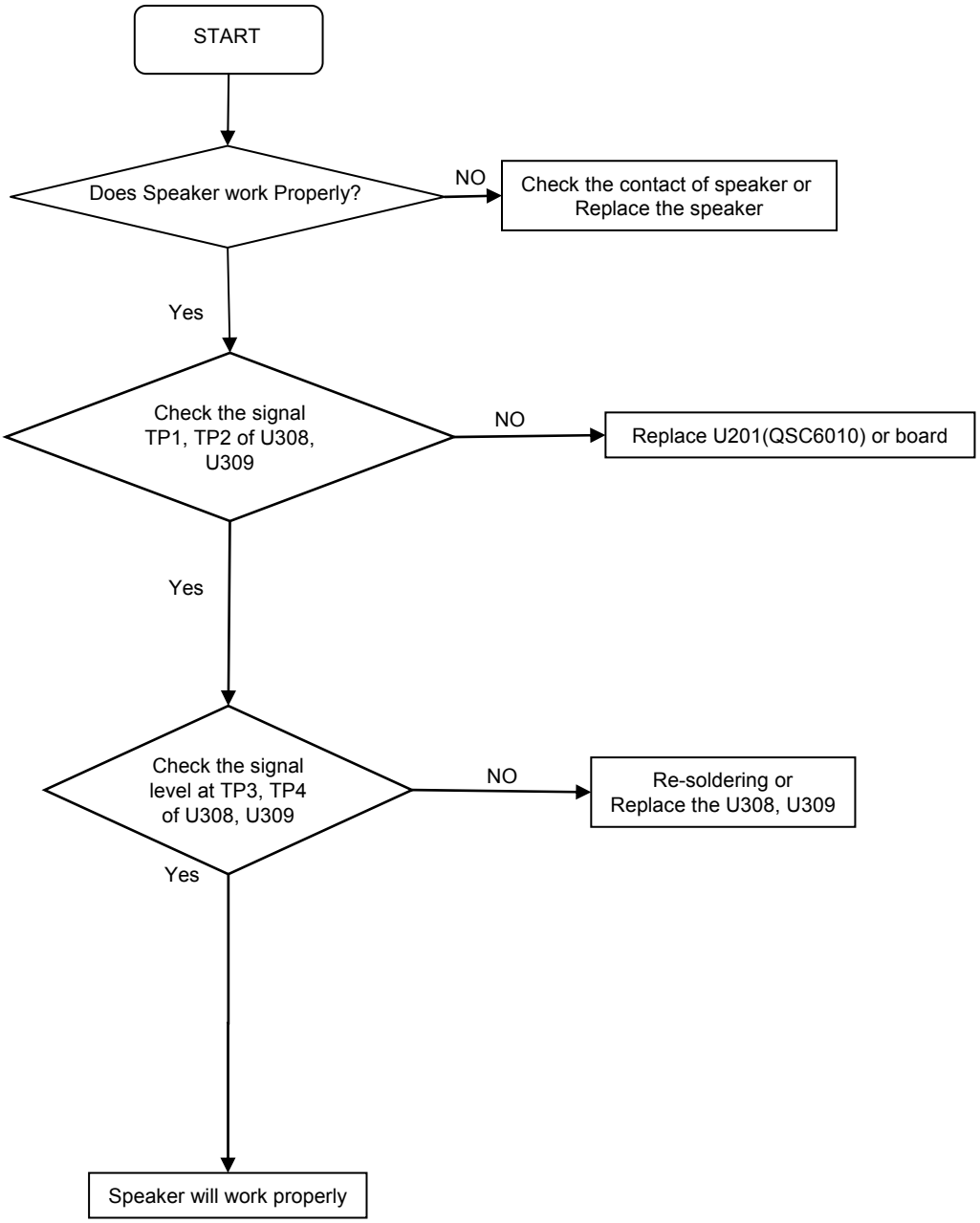
Figure 3.3.3 RECEIVER PART

Circuit Diagram



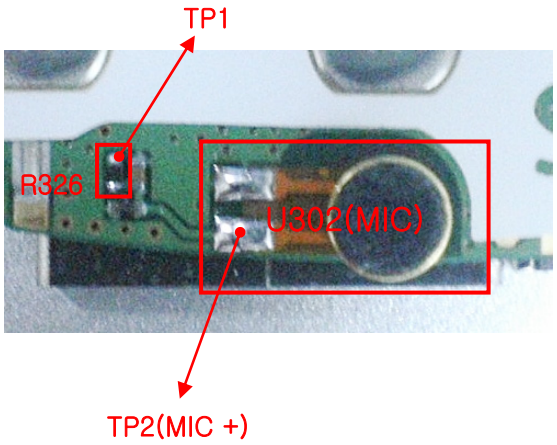
Checking Flow

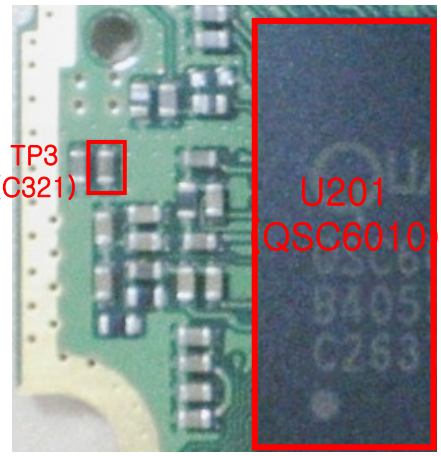
SETTING : “Ringers” at Sounds menu



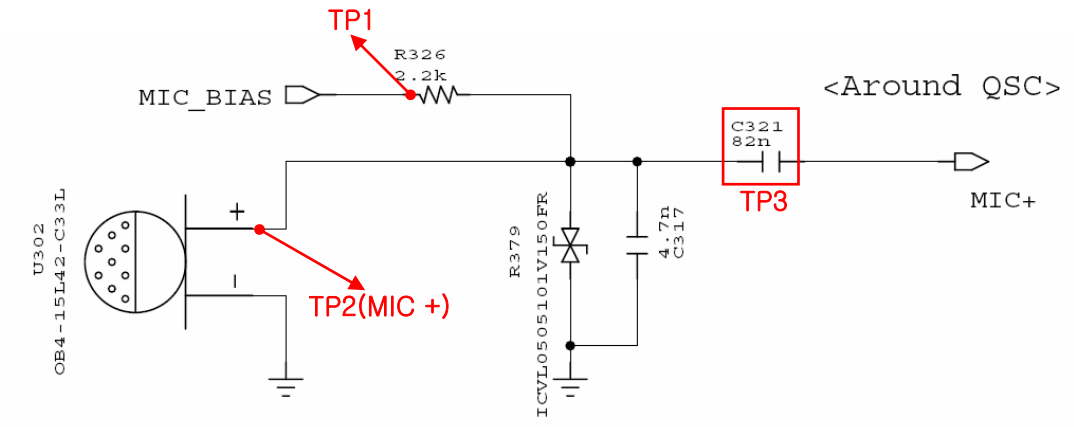
3.3.6 MIC Trouble

Test points



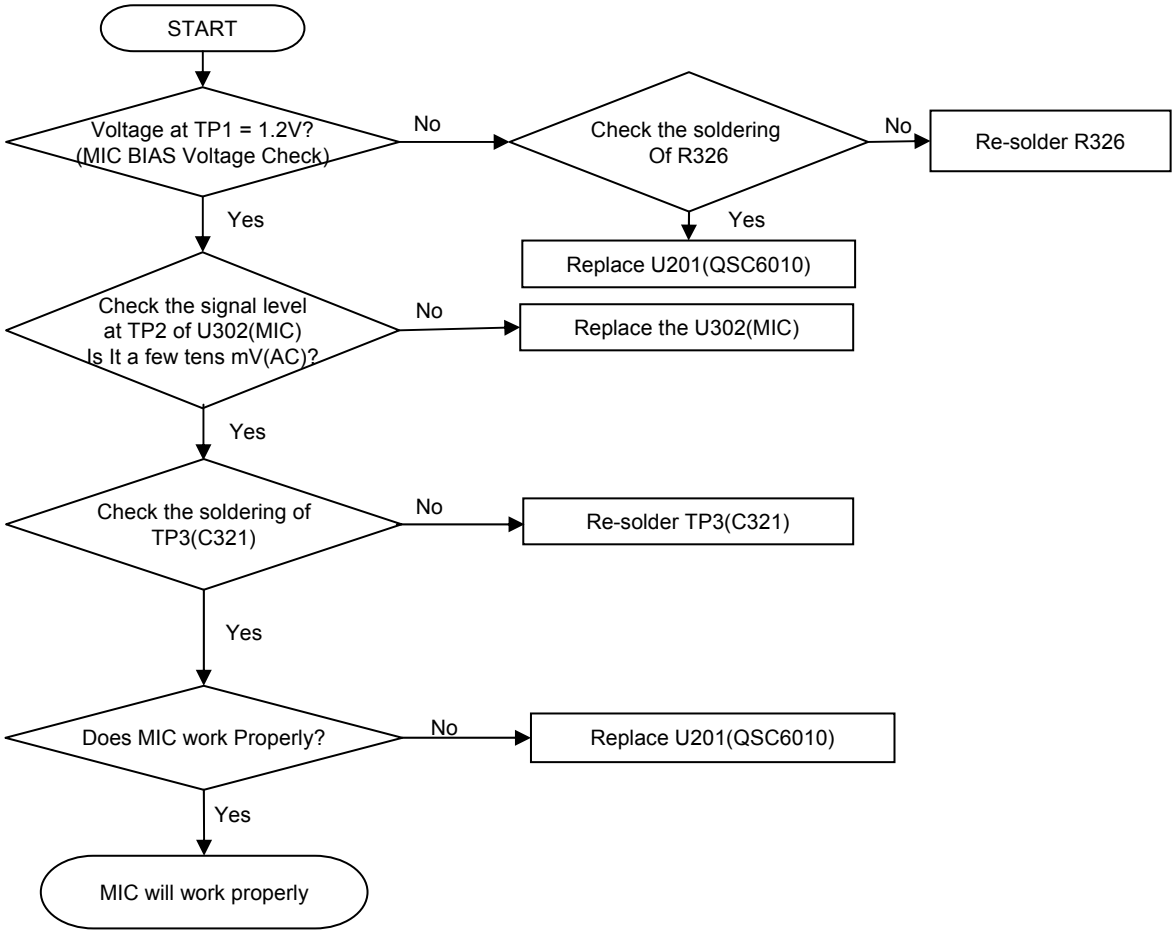


Circuit Diagram



Checking Flow

SETTING : After initialize 5515C, Test US Cellular



3.3.7 Vibrator Trouble

Test points

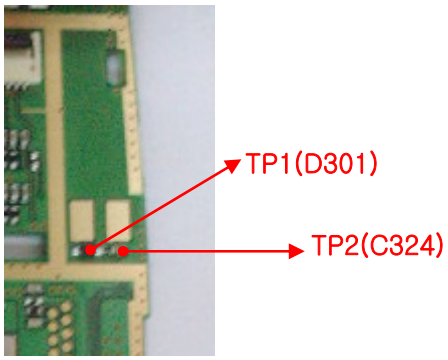


Figure 3.3.7 Vibrator PART

Circuit Diagram

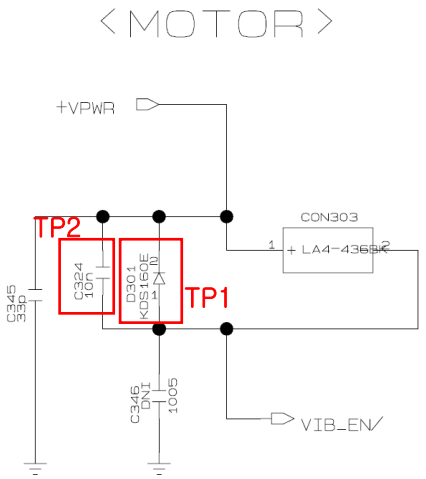
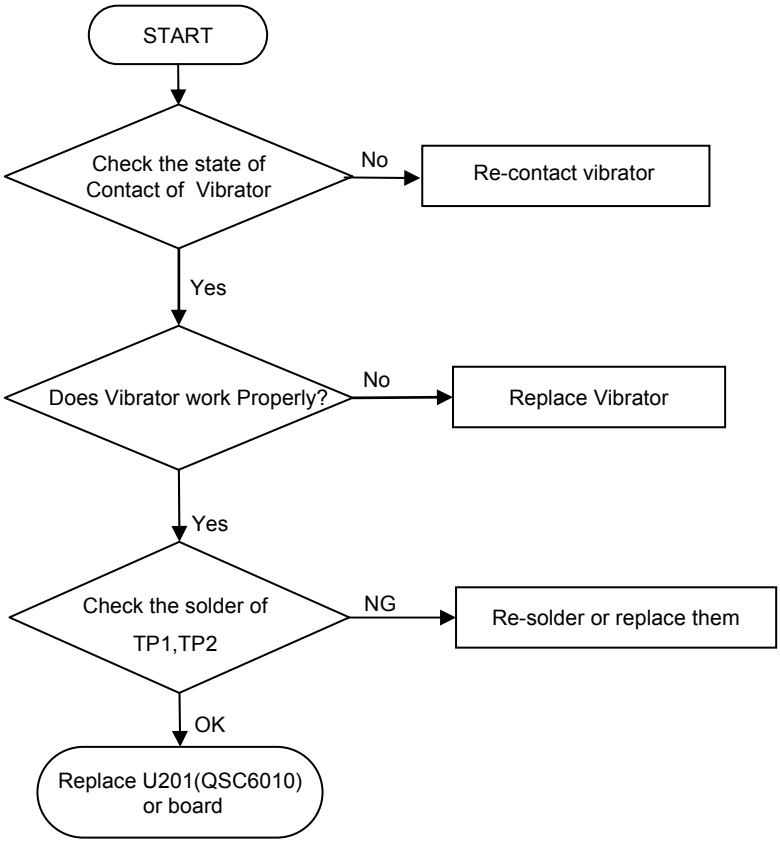


Figure 3.3.7 VIBRATION CONTROL BLOCK

Checking Flow

SETTING : "Vibrator on" at Sounds of test menu



3.3.8 Key Backlight LED Trouble

Test Points

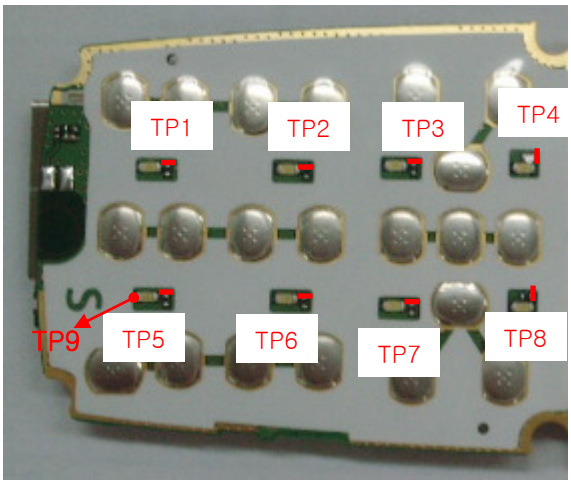


Figure 3.3.8 KEYPAD BACK LIGHT PART

Circuit Diagram

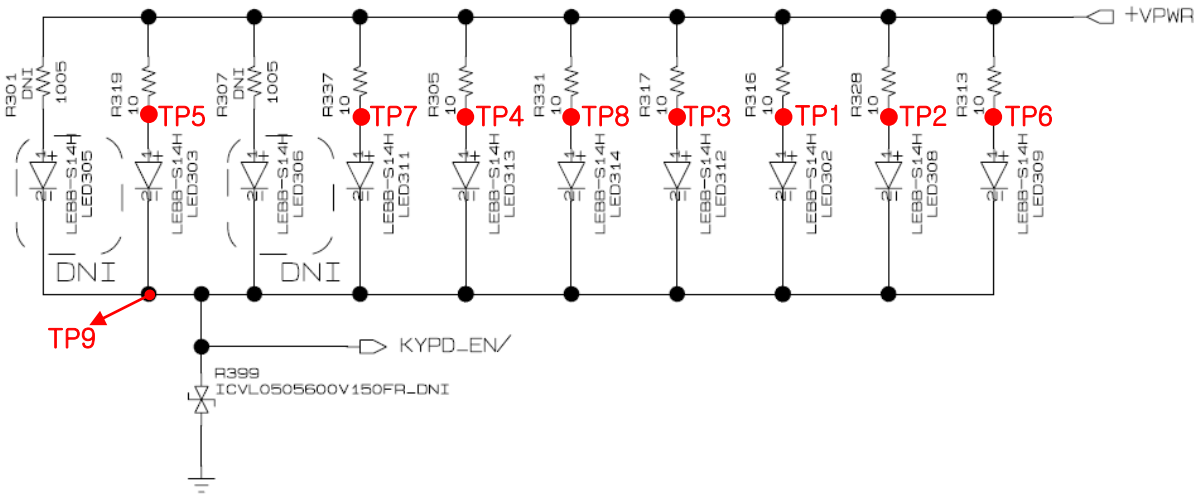
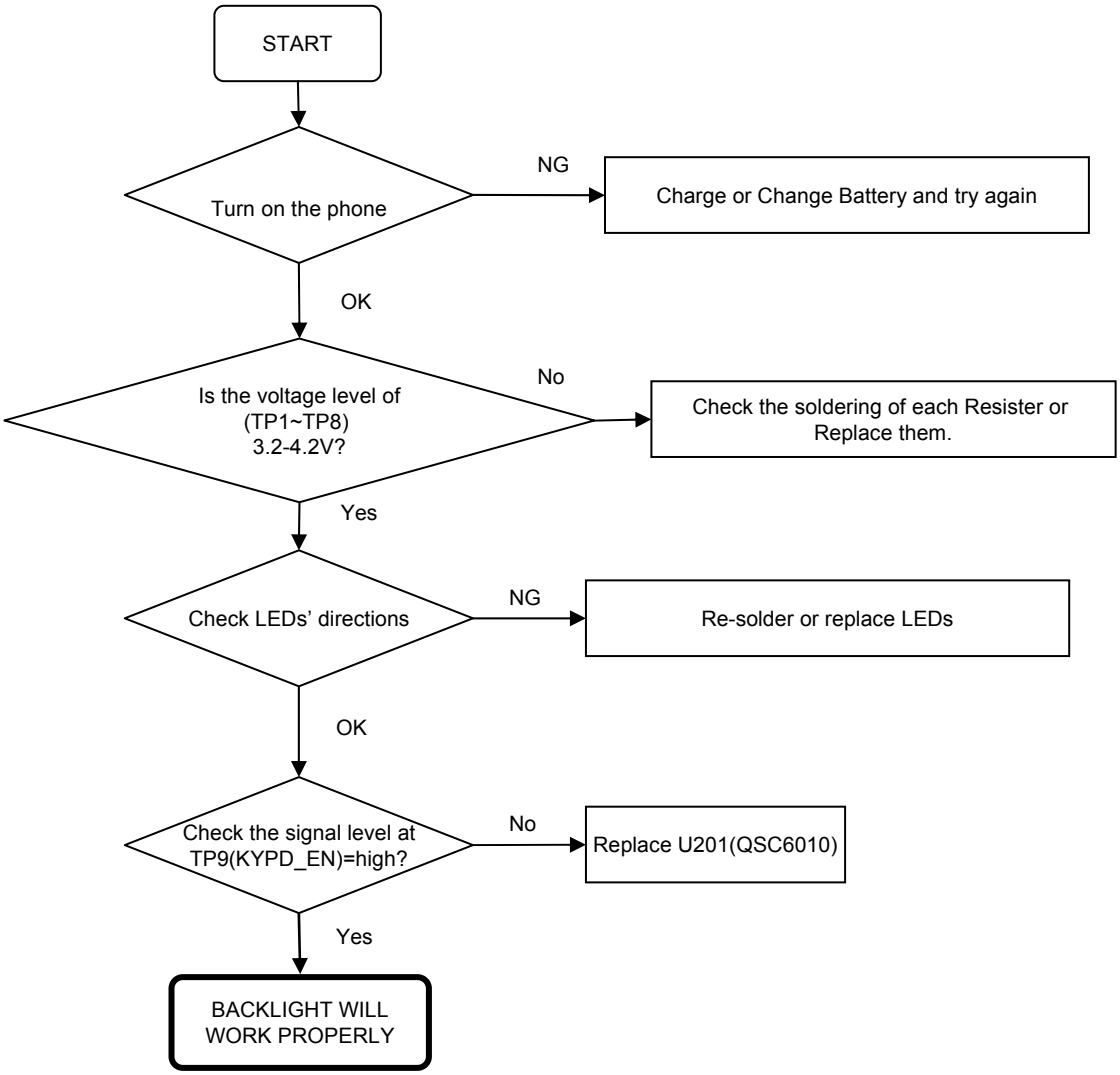


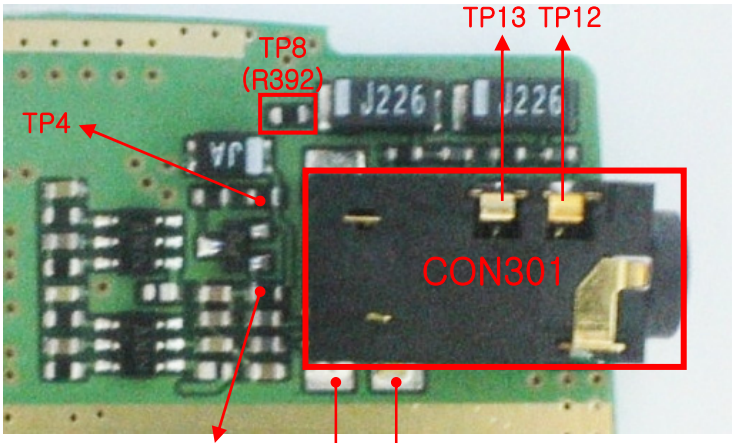
Figure 3.3.8 KEYPAD Back Light Circuit

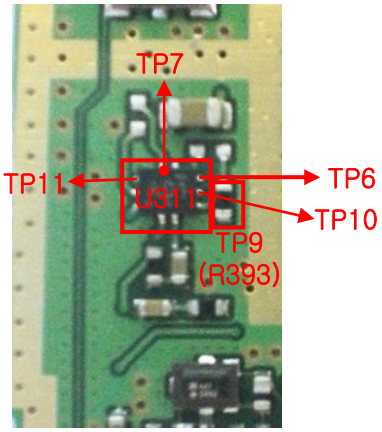
Checking Flow



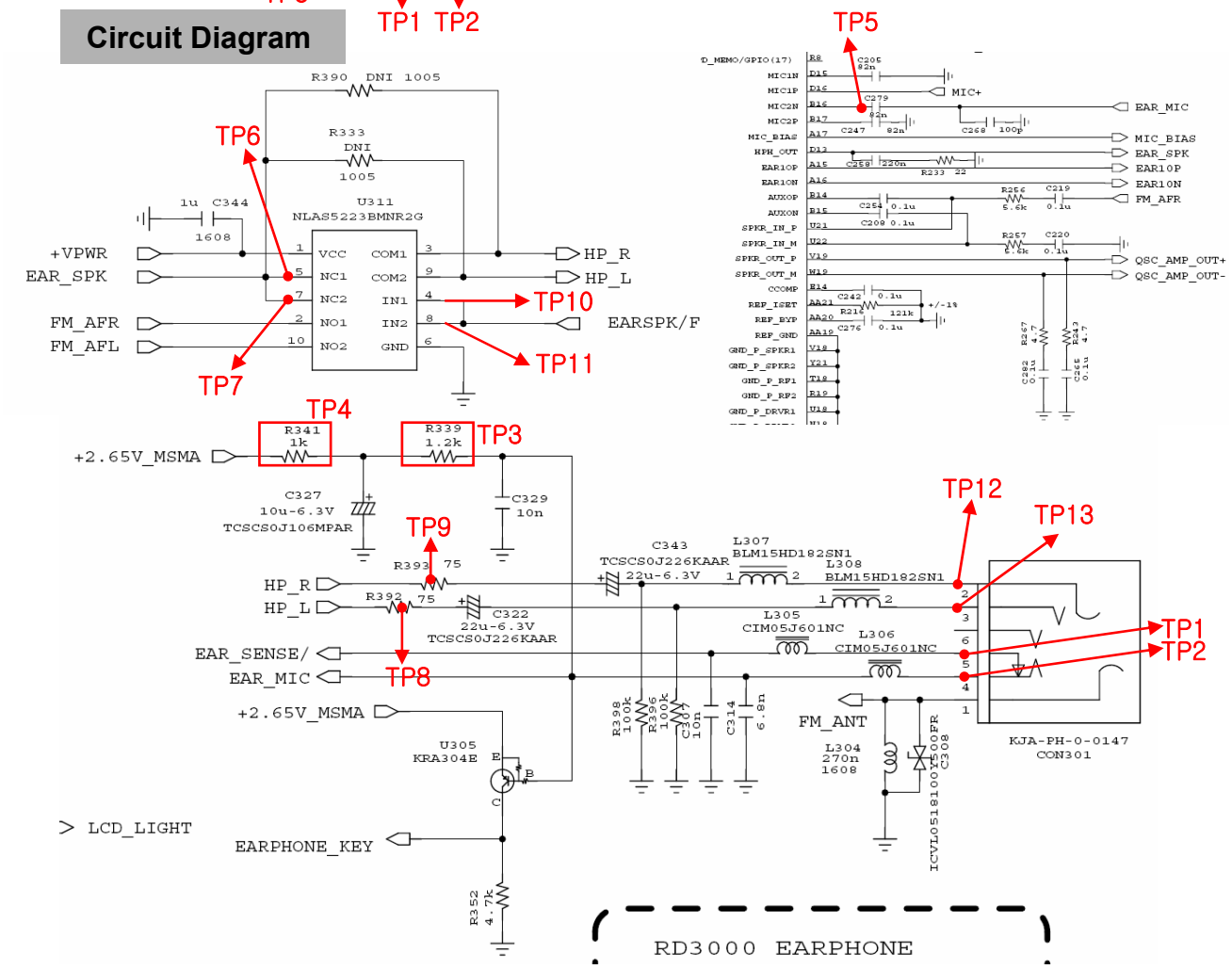
3.3.9 Earphone Trouble

Test Points



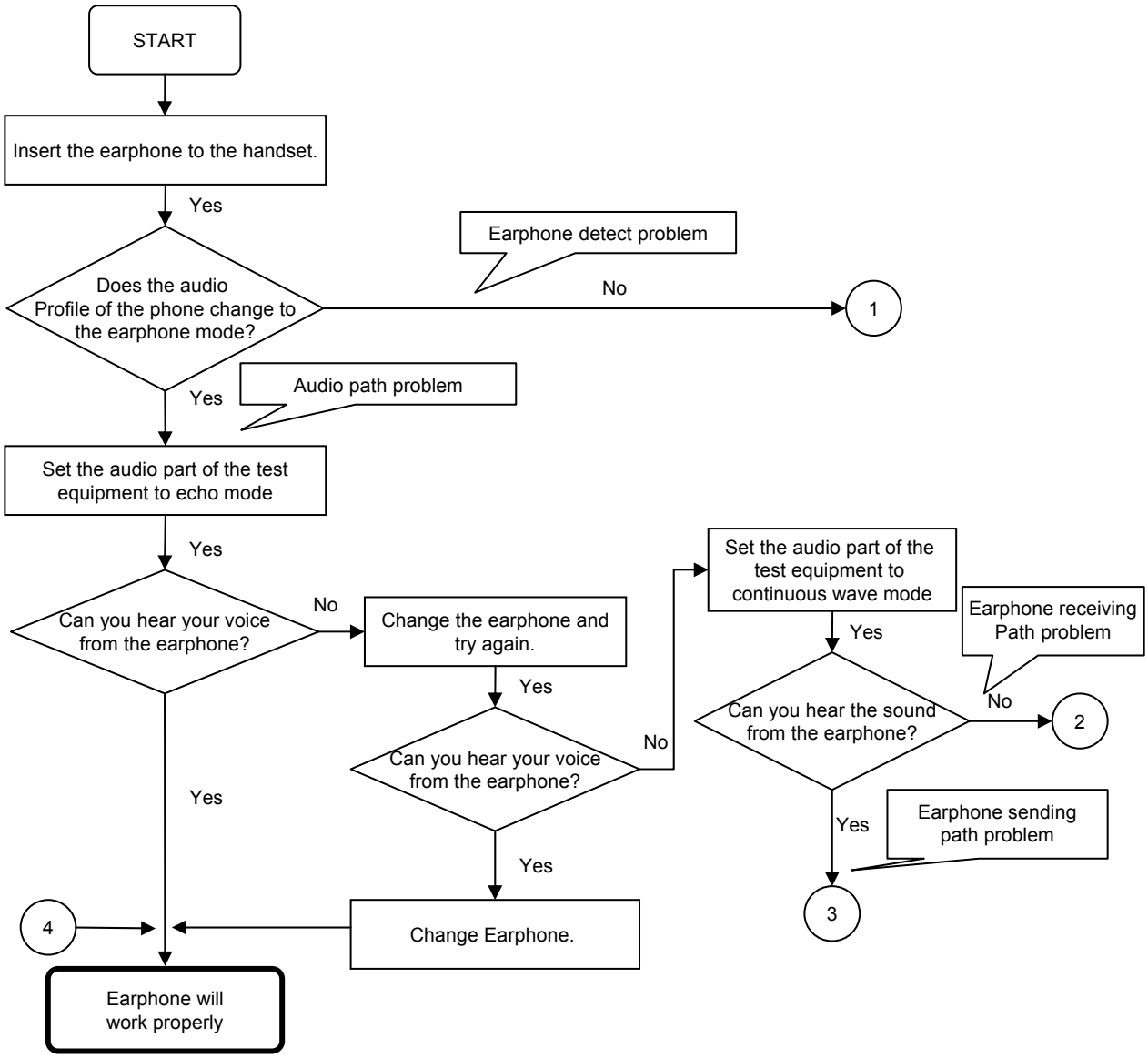


Circuit Diagram

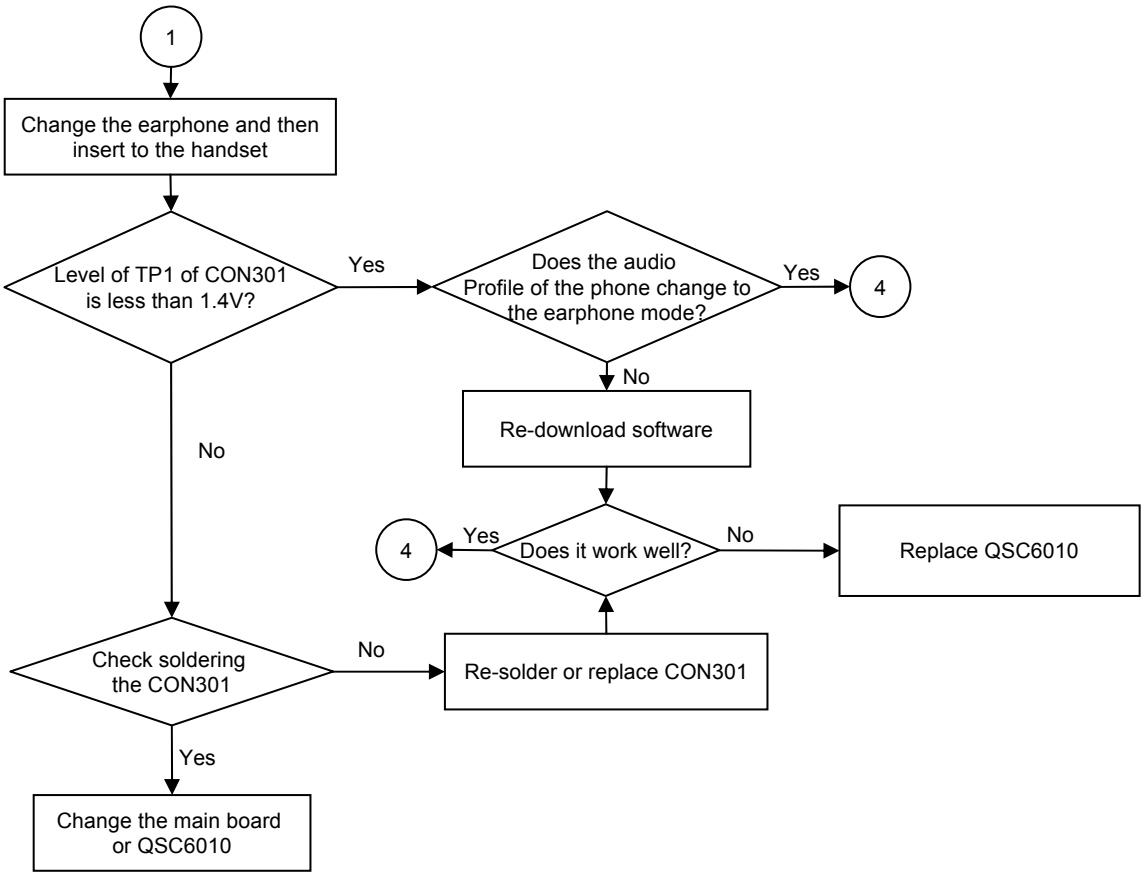


Checking Flow

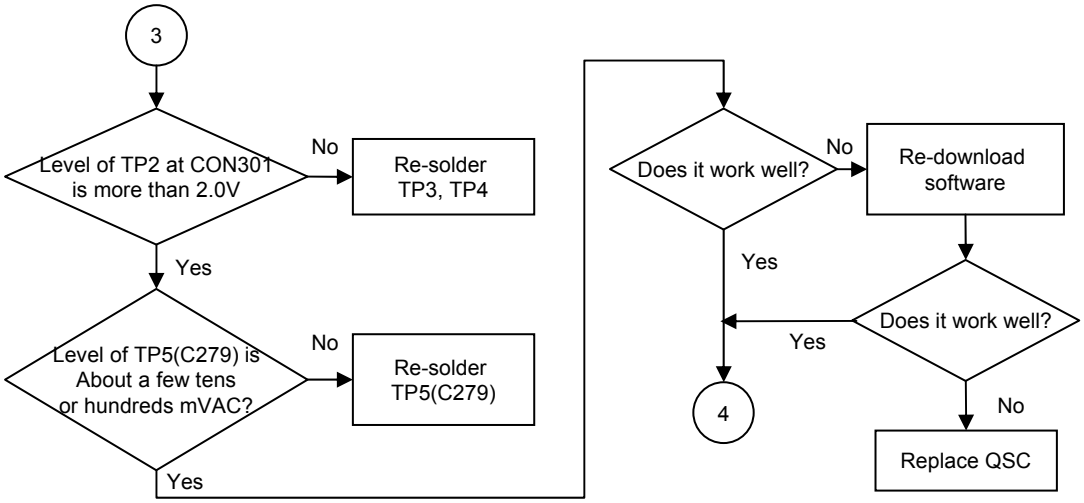
SETTING : After initialize 5515C, Test US Cellular



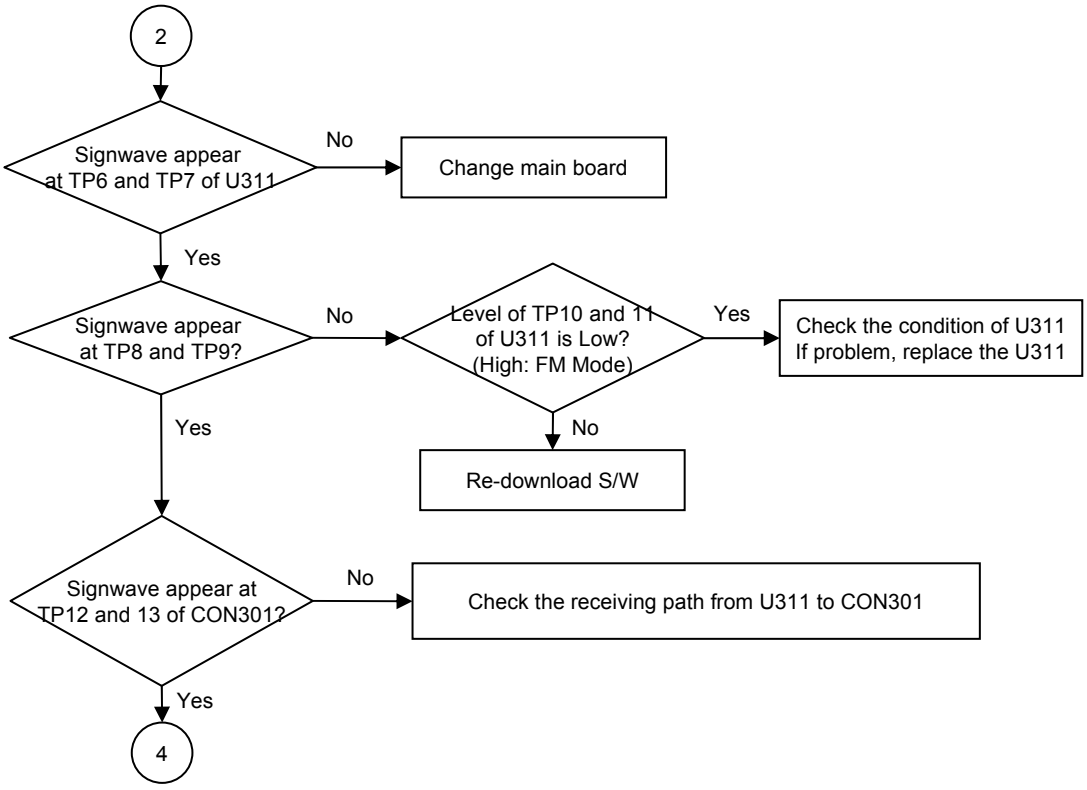
Earphone detect problem



Earphone sending path problem

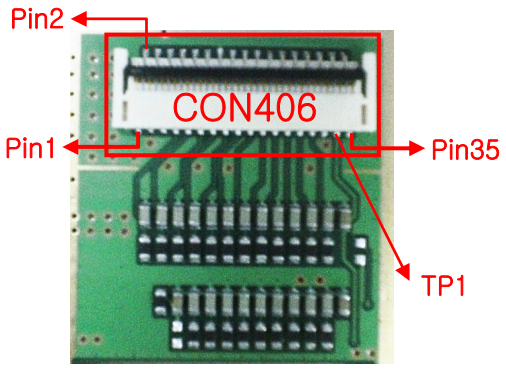


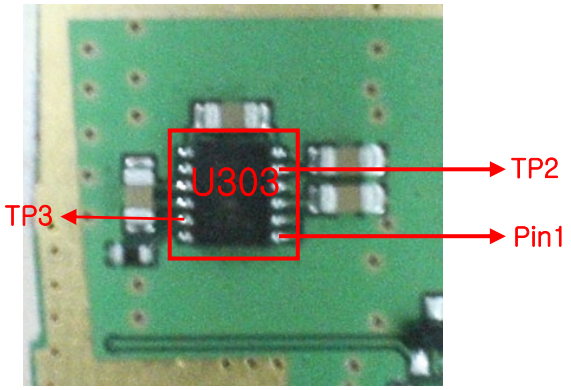
Earphone receiving path problem



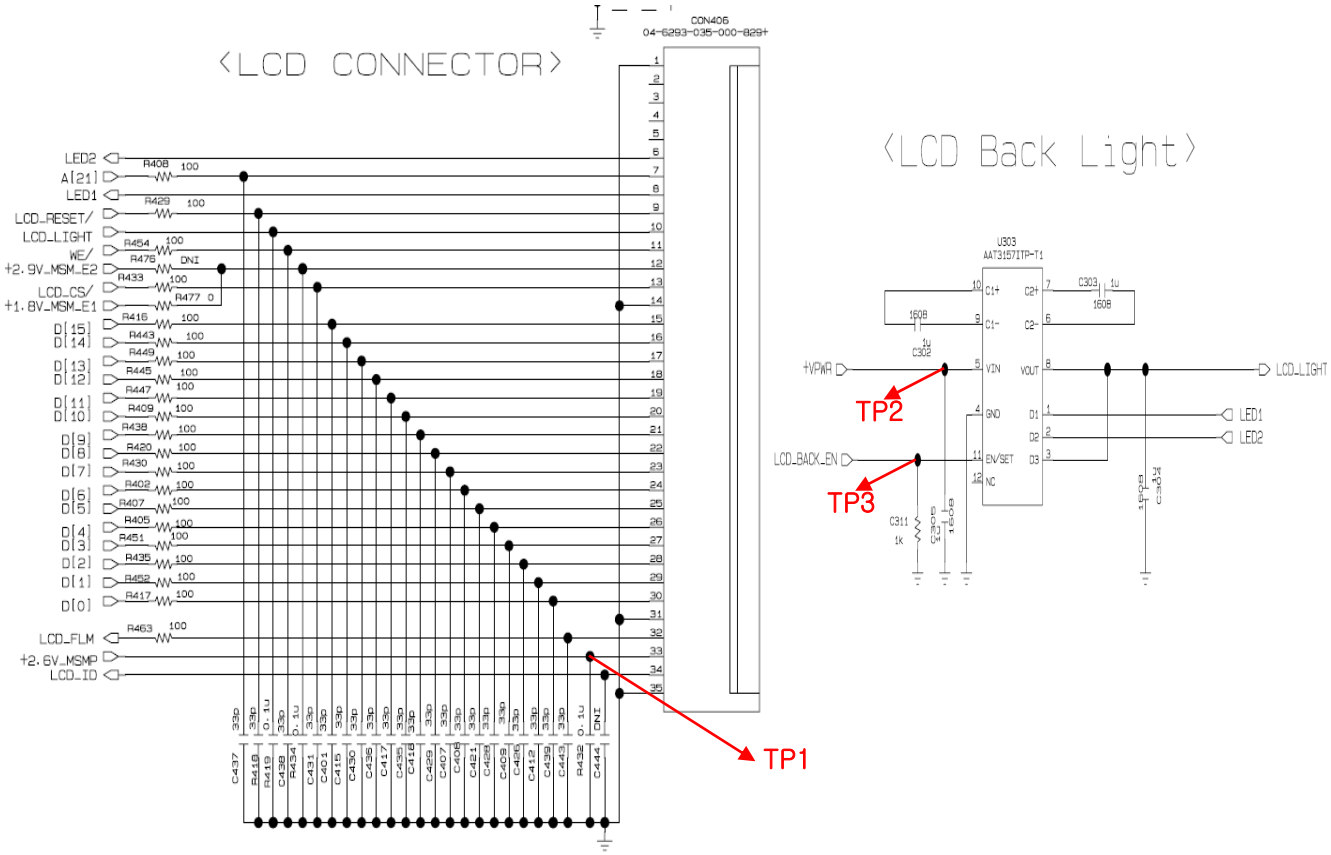
3.3.10 LCD Trouble

Test Points

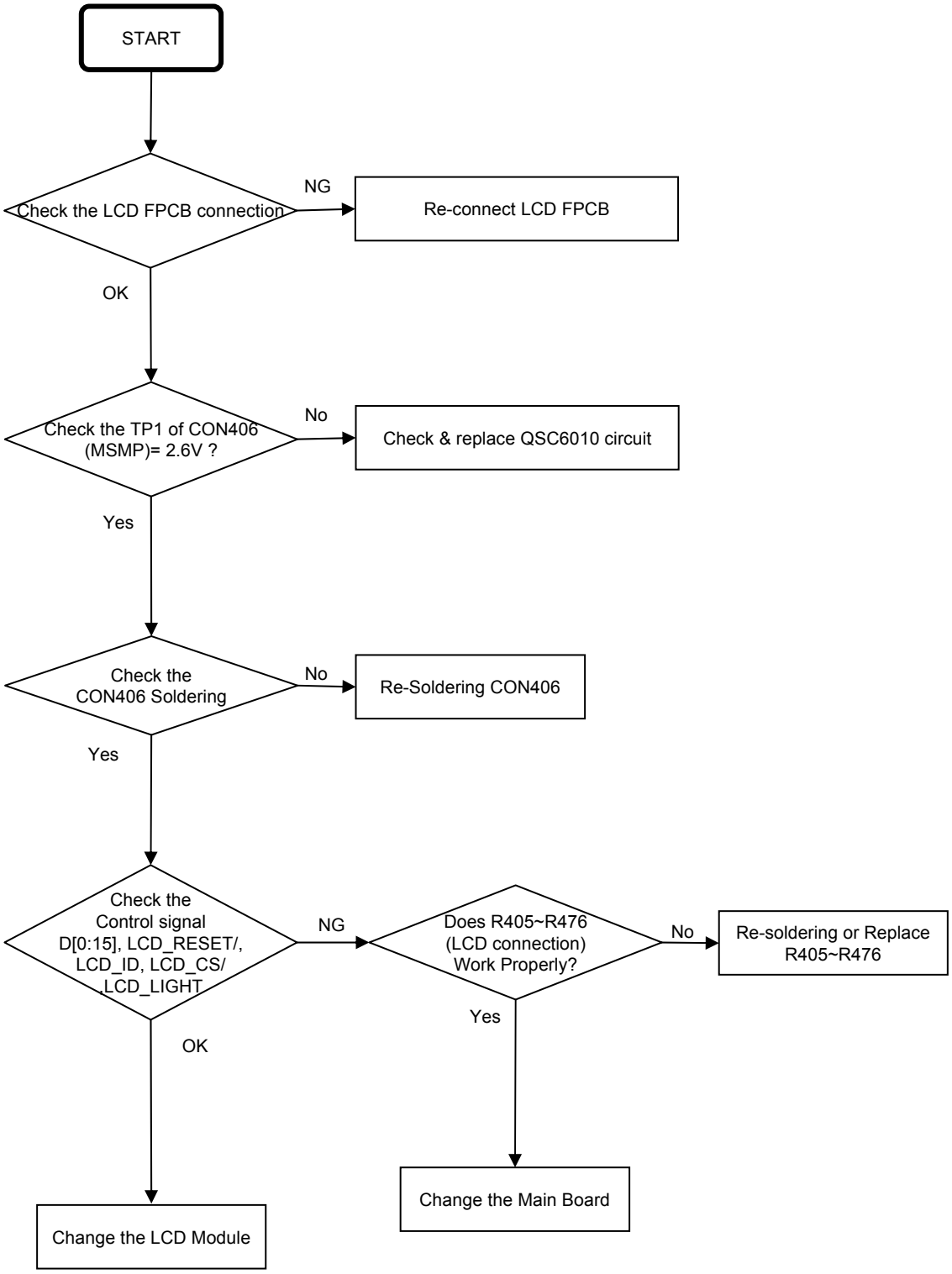




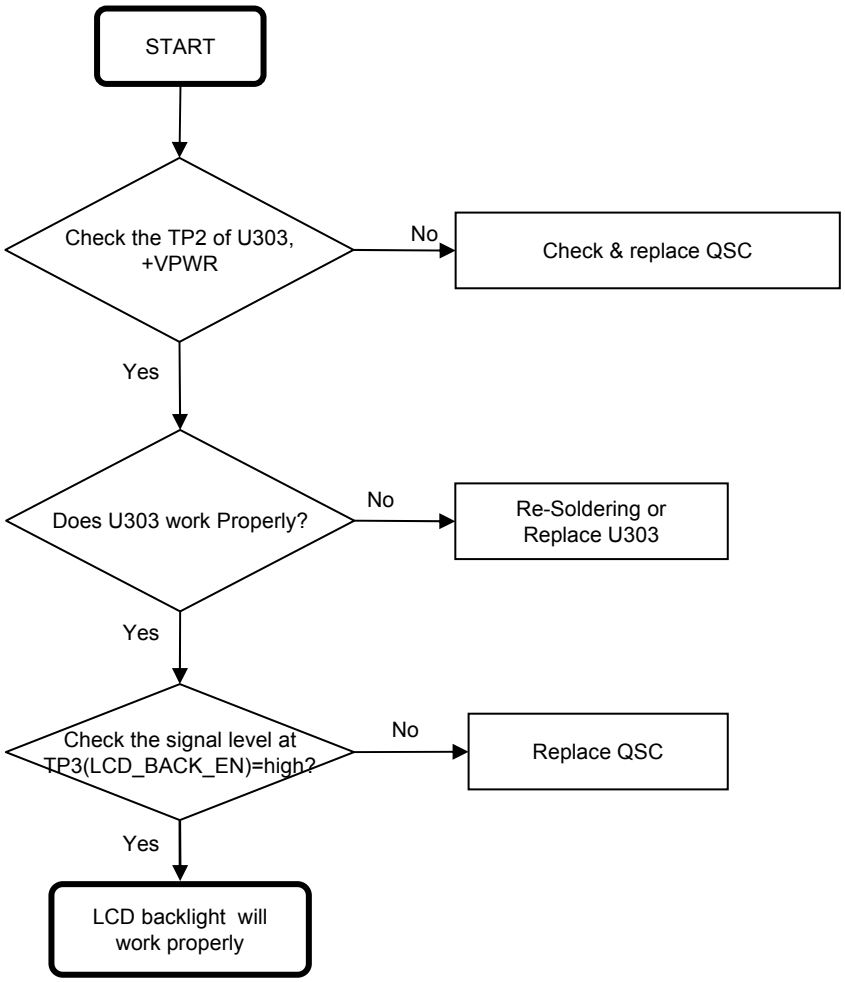
Circuit Diagram



Checking Flow : LCD

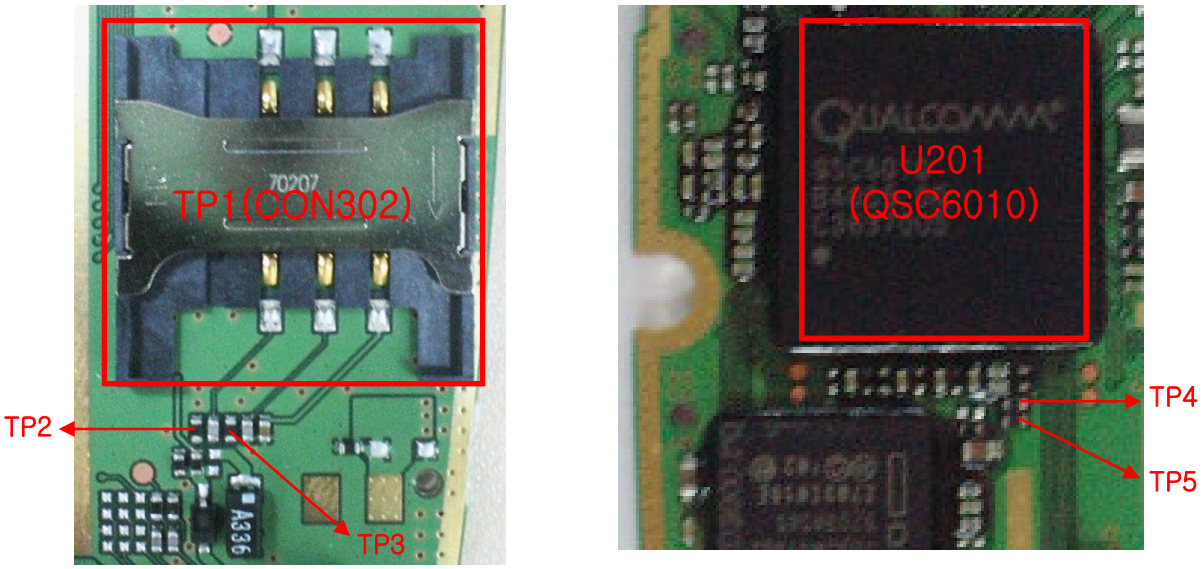


Checking Flow : Back Light

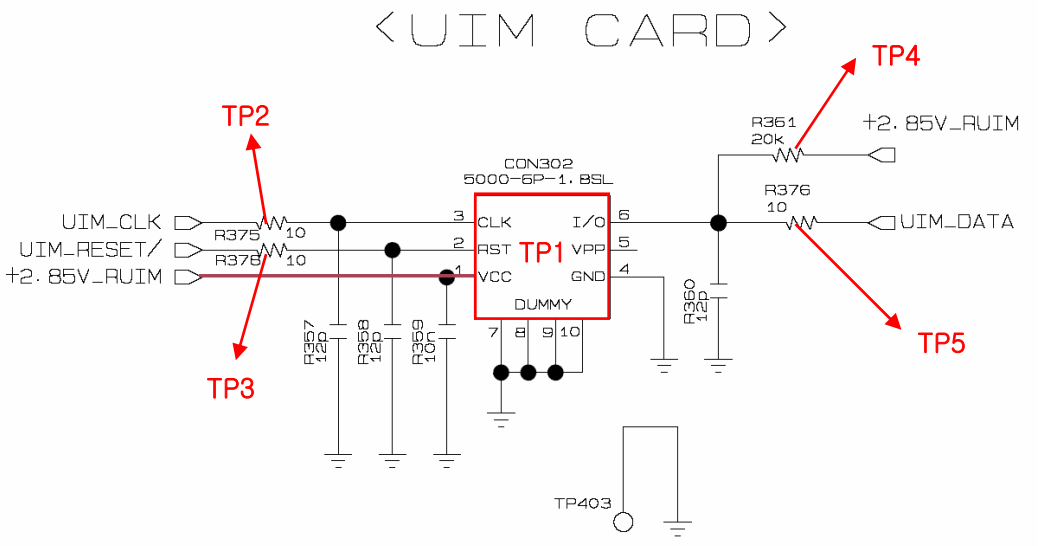


3.3.11 UIM Trouble

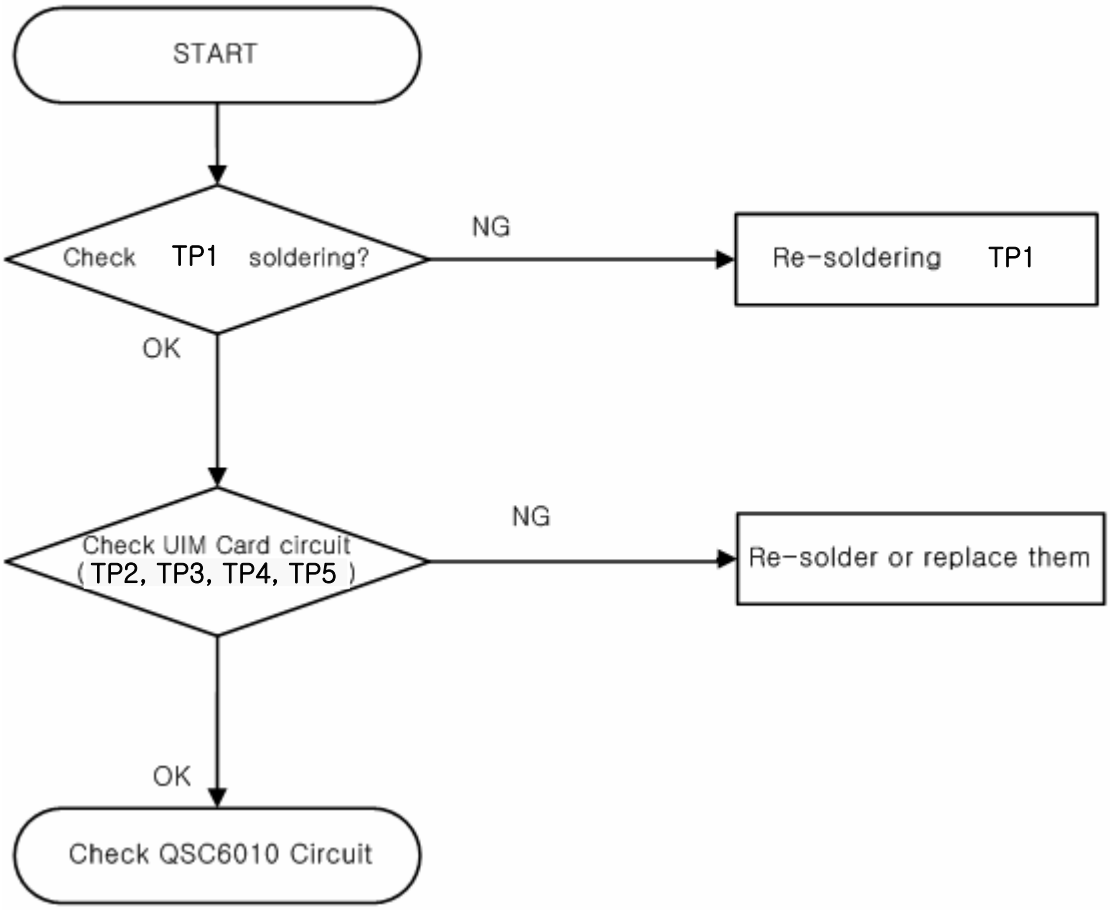
Test Points



Circuit Diagram

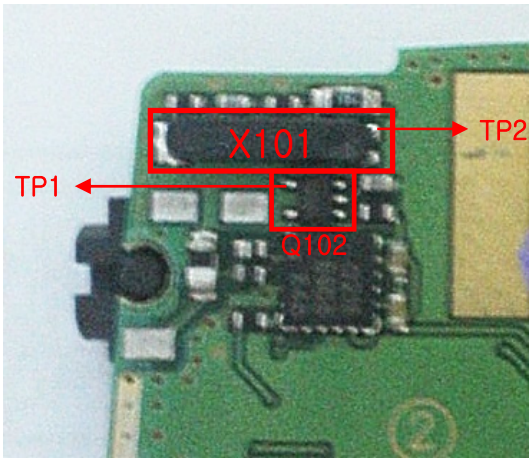


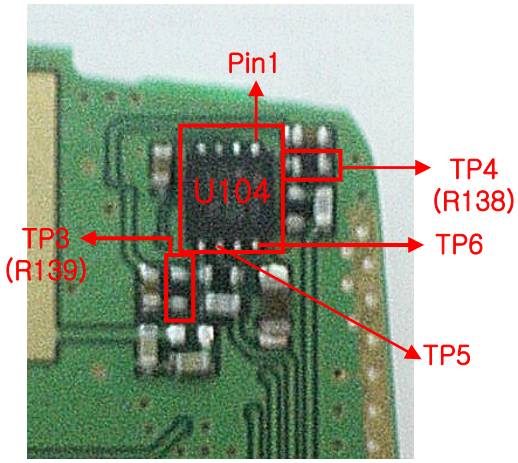
Checking Flow



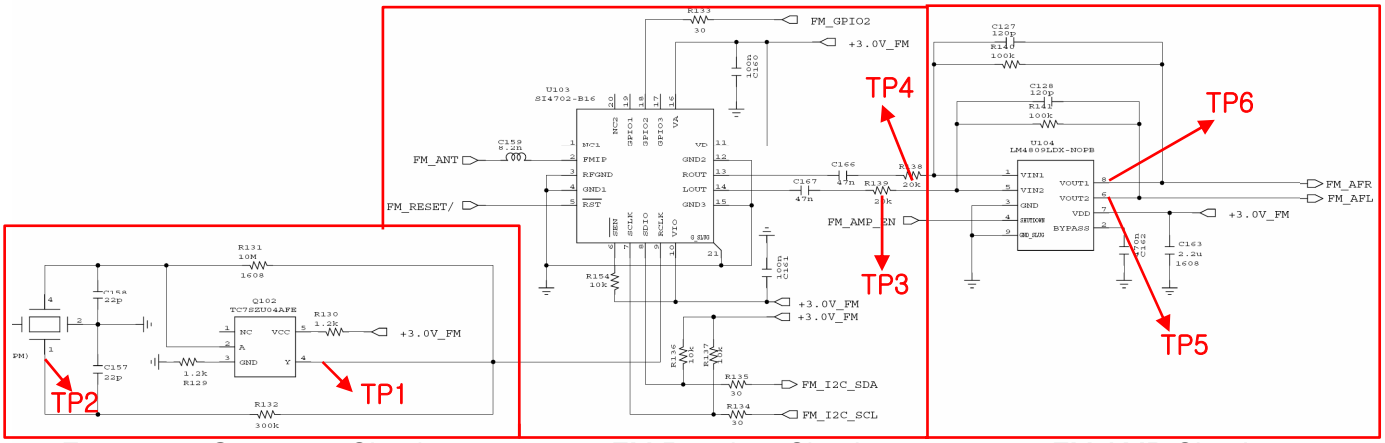
3.3.12 FM Radio Trouble

Test Points





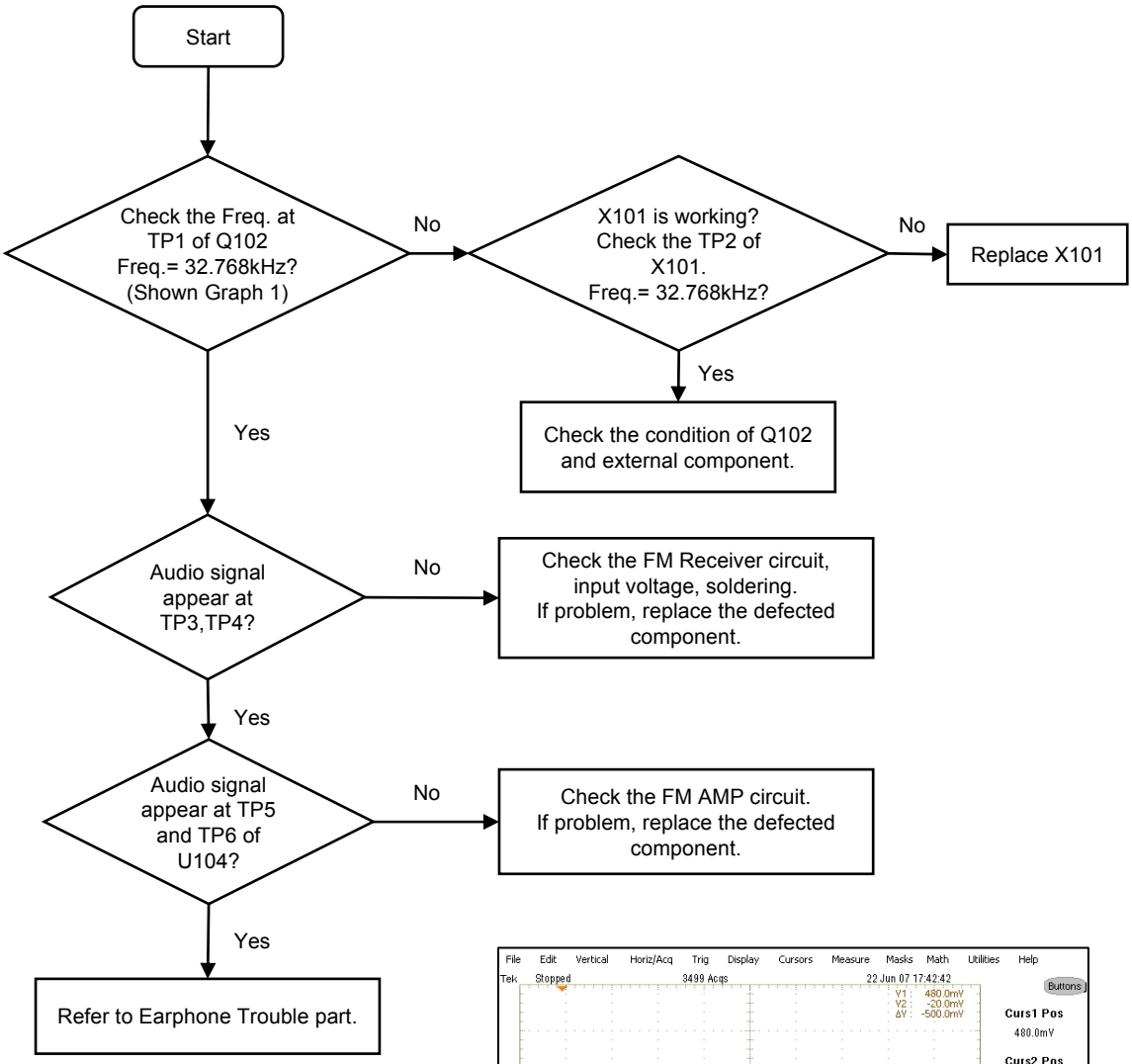
Circuit Diagram

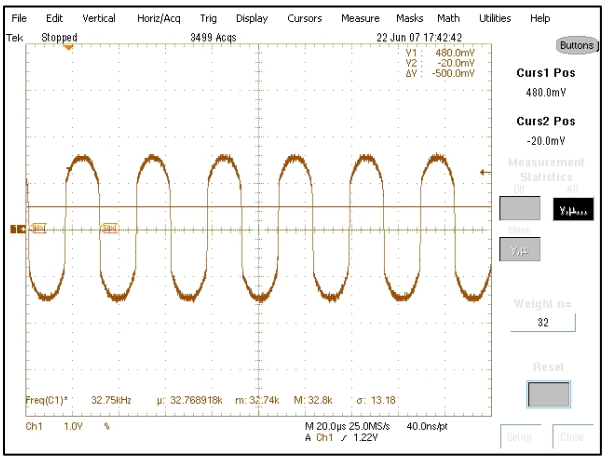


Frequency Generator Circuit | FM Receiver Circuit | FM AMP Circuit

Checking Flow

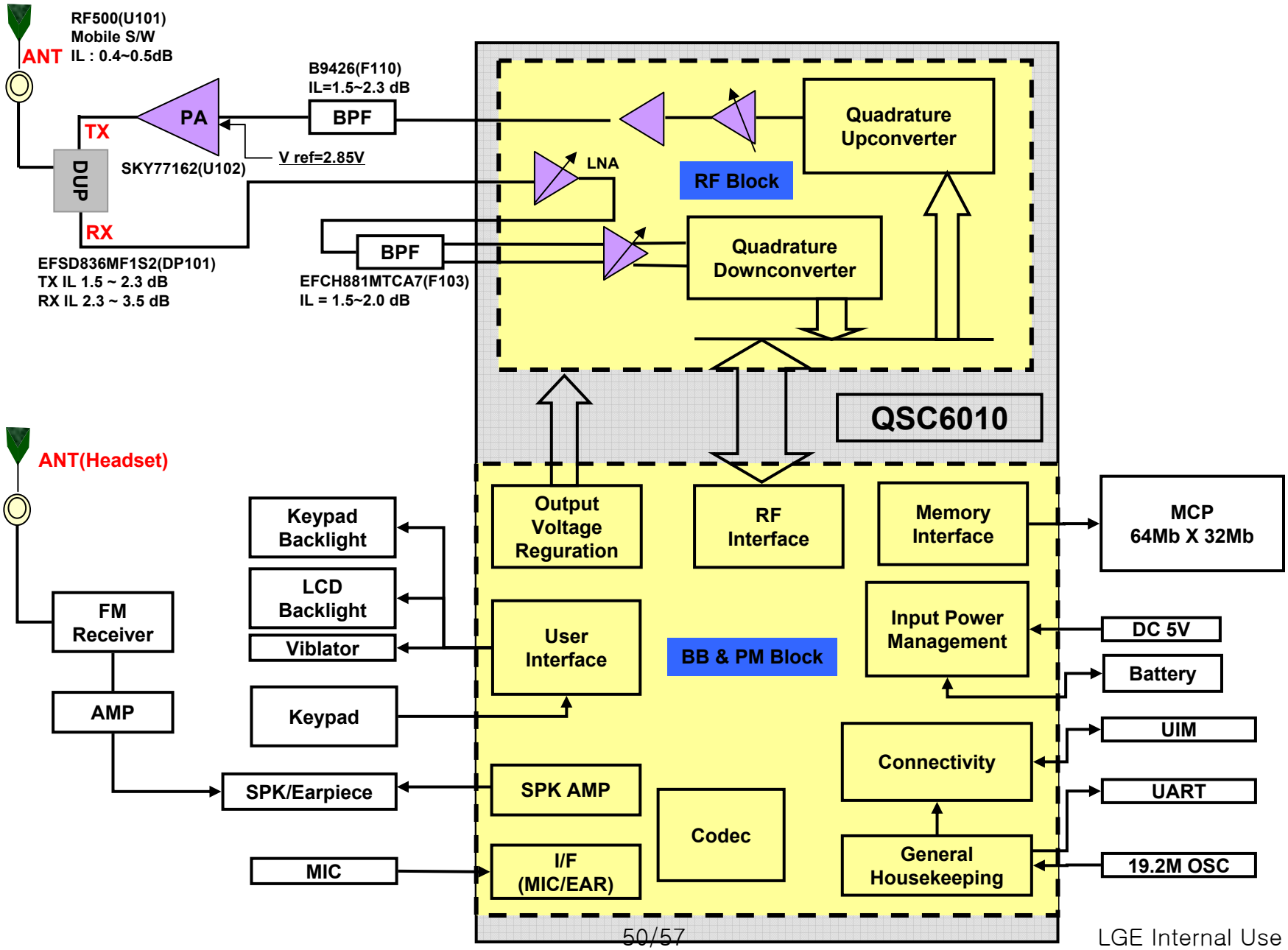
SETTING : Attach the headset and “Listen to Radio” at Radio menu

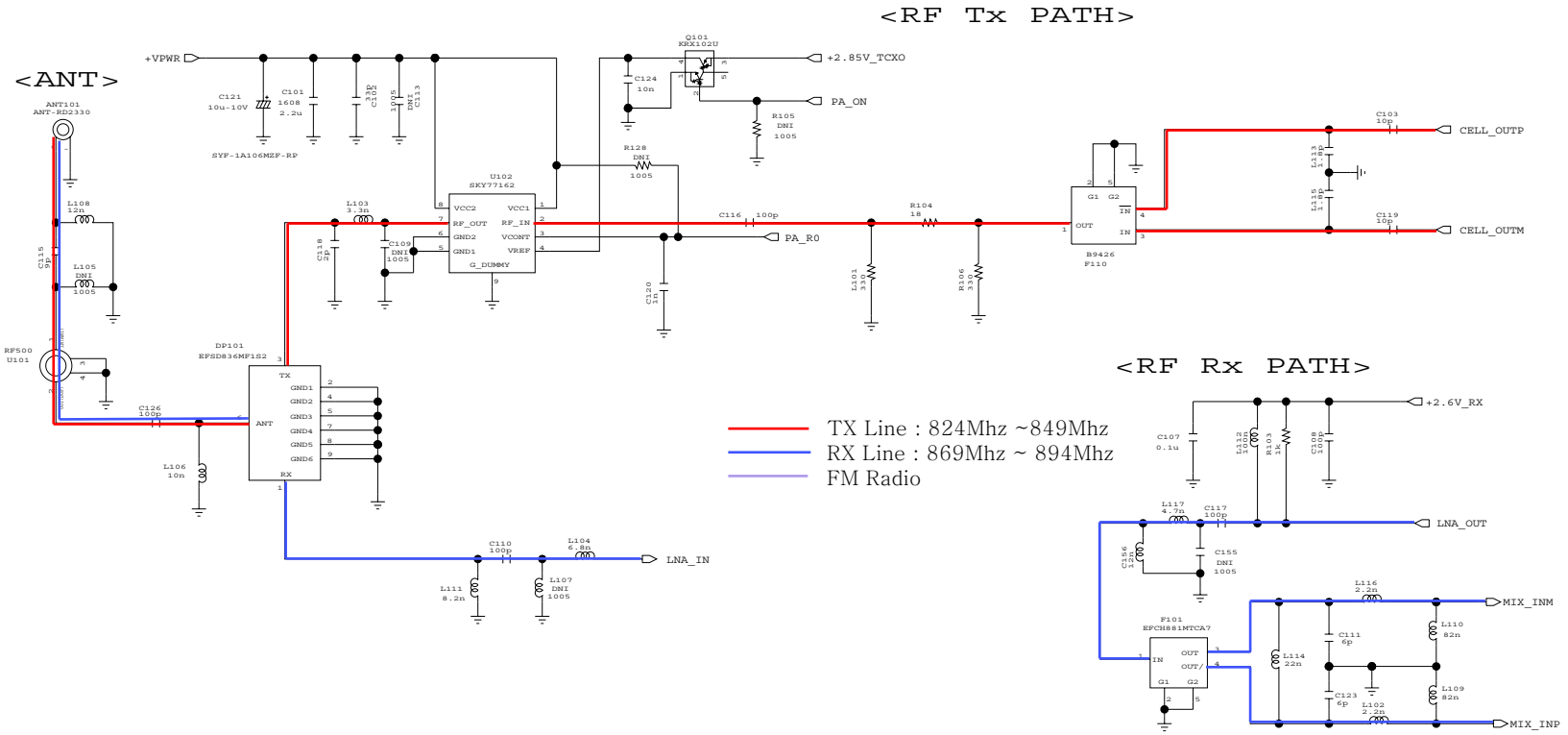


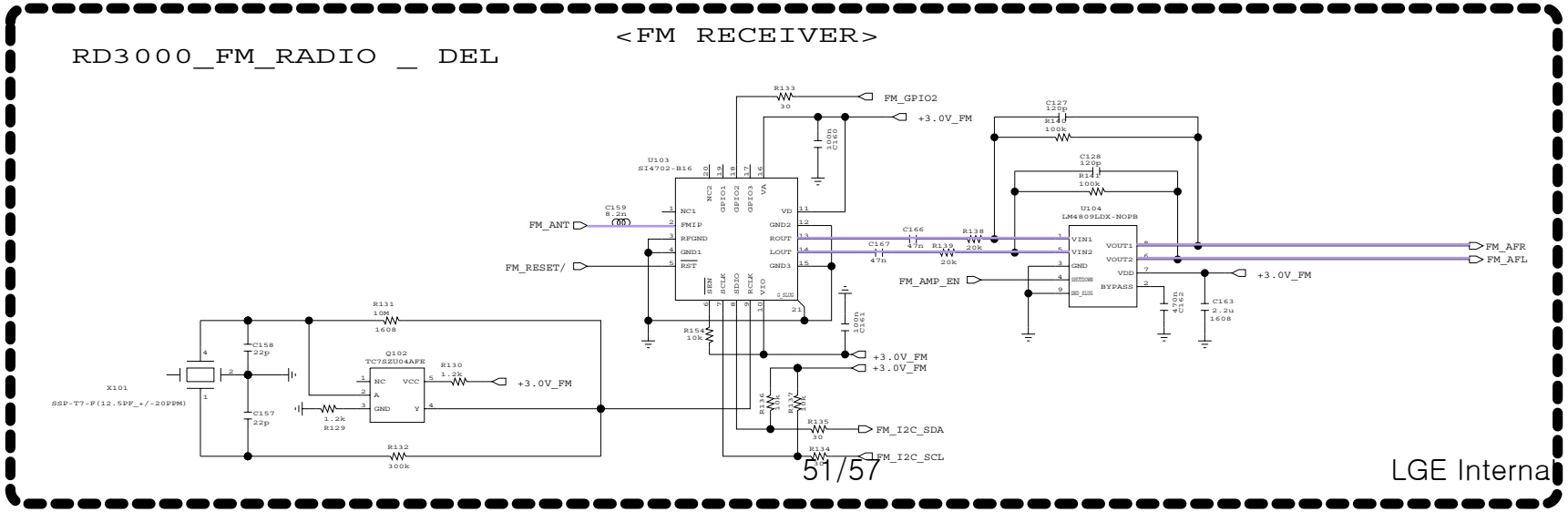


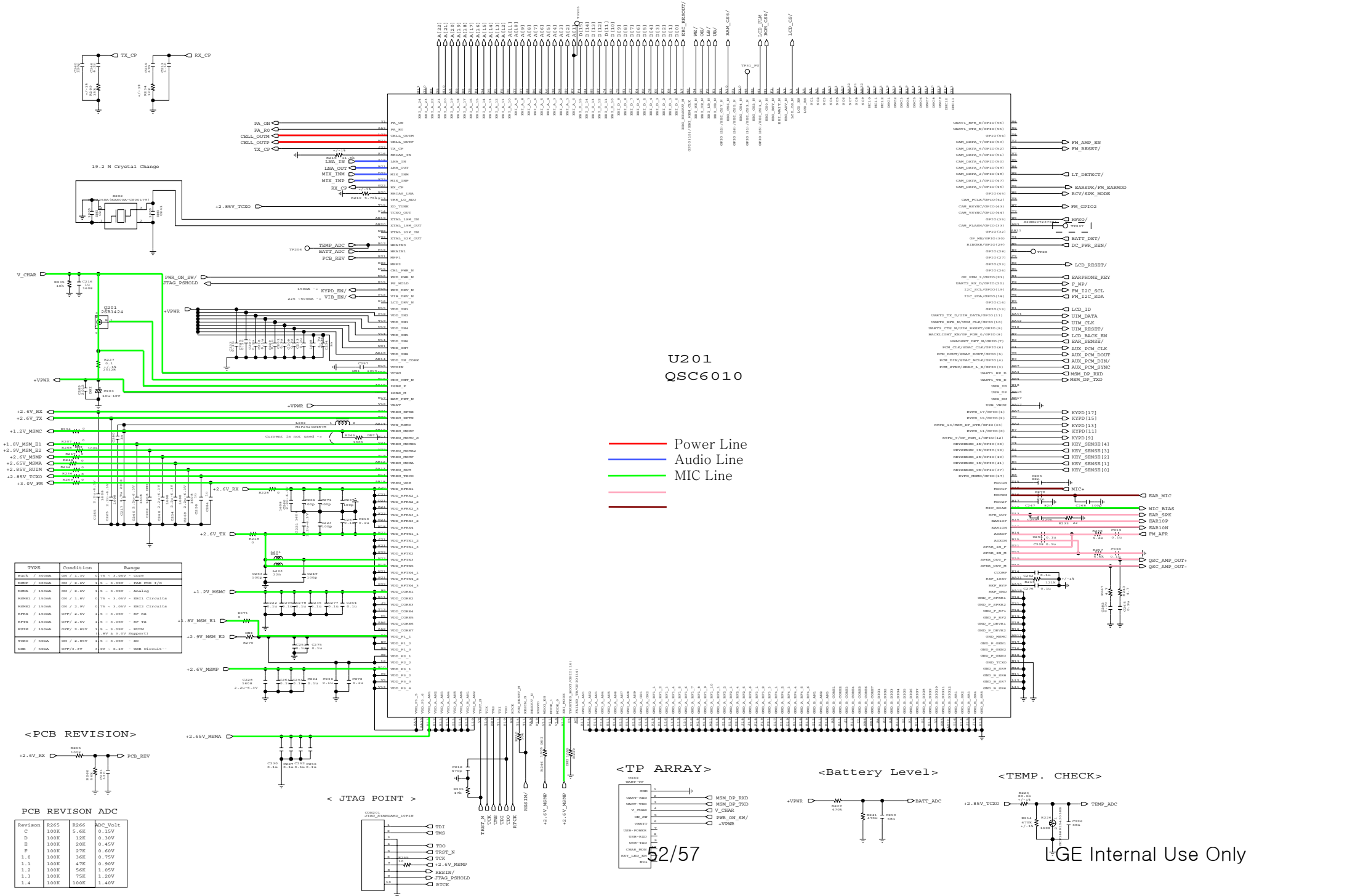
Graph 1. FM Radio Clock

ID3100 Block Diagram





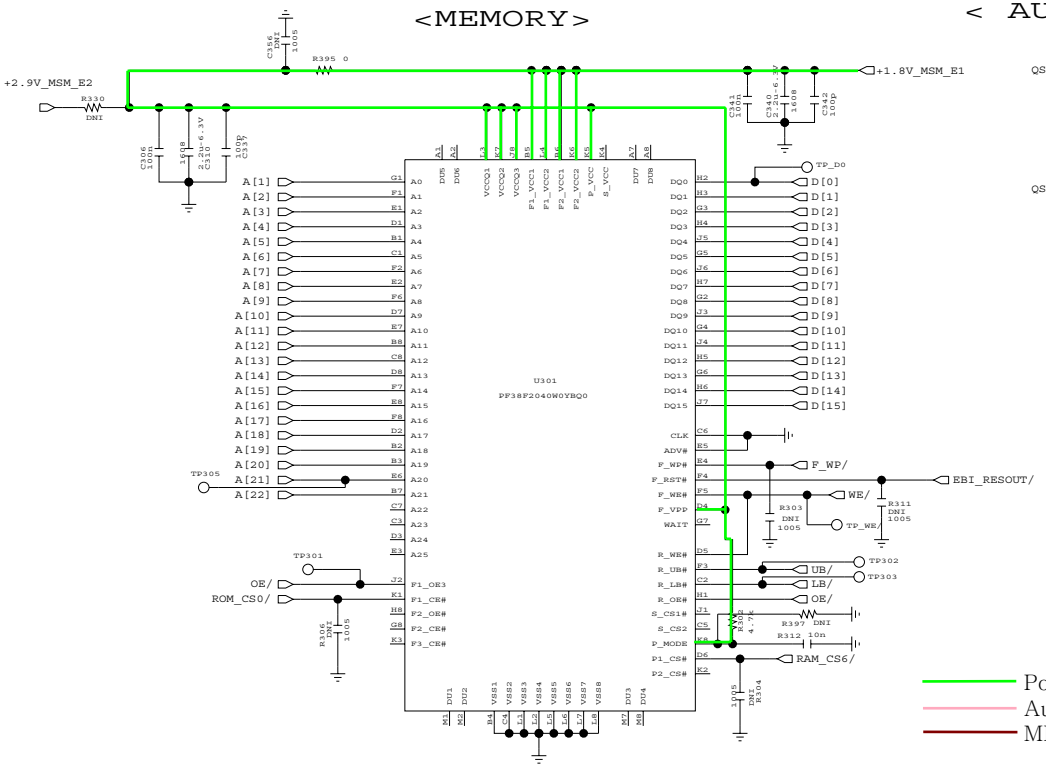




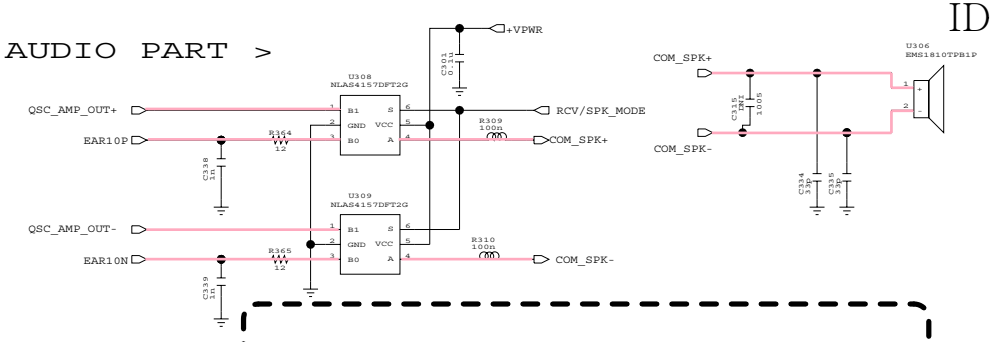
TYPE	Condition	Range
Buck / 300mA	ON / 1.3V	0.75 ~ 3.05V - Core
MSMP / 150mA	ON / 2.6V	1.5 ~ 3.05V - PAD_MSM_I/O
MSMA / 150mA	ON / 2.6V	1.5 ~ 3.05V - Analog
MSMR1 / 150mA	ON / 1.8V	0.75 ~ 3.05V - RX11 Circuits
MSMR2 / 150mA	ON / 2.9V	0.75 ~ 3.05V - RX12 Circuits
RFRX / 150mA	OFF/ 2.6V	1.5 ~ 3.05V - RF RX
RFTX / 150mA	OFF/ 2.6V	1.5 ~ 3.05V - RF TX
RUIM / 150mA	OFF/ 2.85V	1.5 ~ 3.05V - RUIM (1.8V & 3.0V Support)
TCXO / 50mA	ON / 2.85V	1.5 ~ 3.05V - XO
USB / 50mA	OFF/3.3V	3.0V ~ 6.1V - USB Circuit--

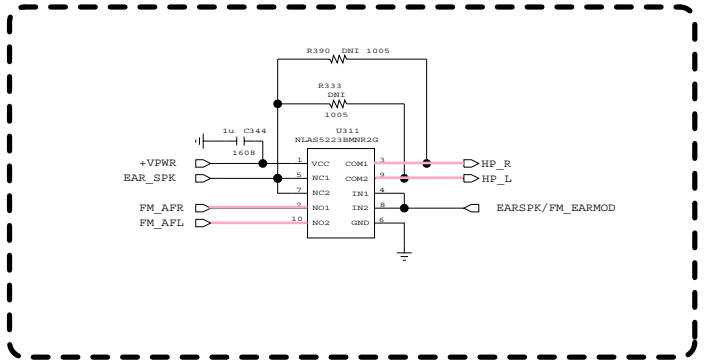
Revison	R265	R266	ADC_Volt
C	100K	5.6K	0.15V
D	100K	12K	0.30V
E	100K	20K	0.45V
F	100K	27K	0.60V
1.0	100K	36K	0.75V
1.1	100K	47K	0.90V
1.2	100K	56K	1.05V
1.3	100K	75K	1.20V
1.4	100K	100K	1.40V

<MEMORY>

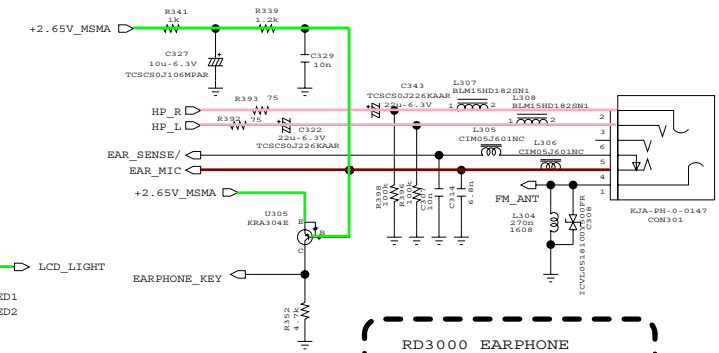


< AUDIO PART >



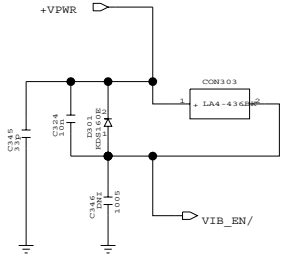


<EAR MIC JACK>

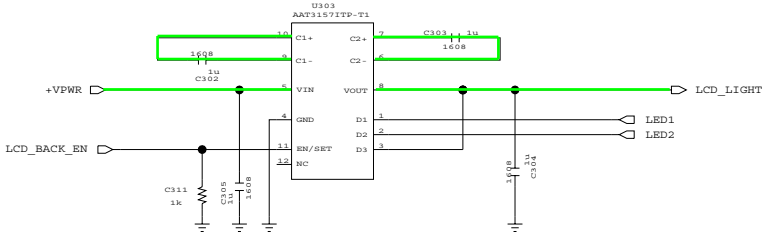


RD3000 EARPHONE
HP_R : C343, L307, R398 : DEL
L305, L306, L308 -> 1005 0R
L304, -> 1608 0R

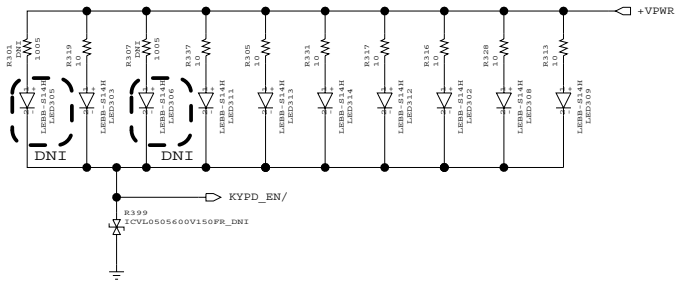
<MOTOR>



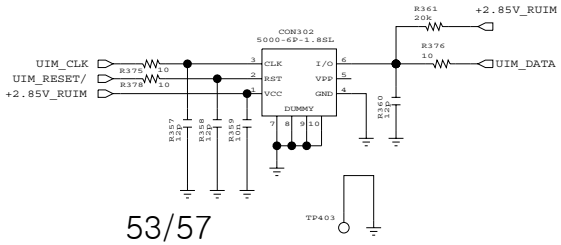
<LCD Back Light>



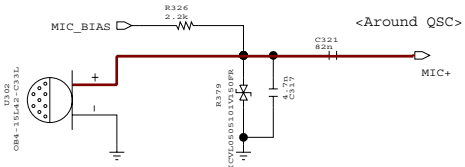
<KEY LED PART>



<UIM CARD>

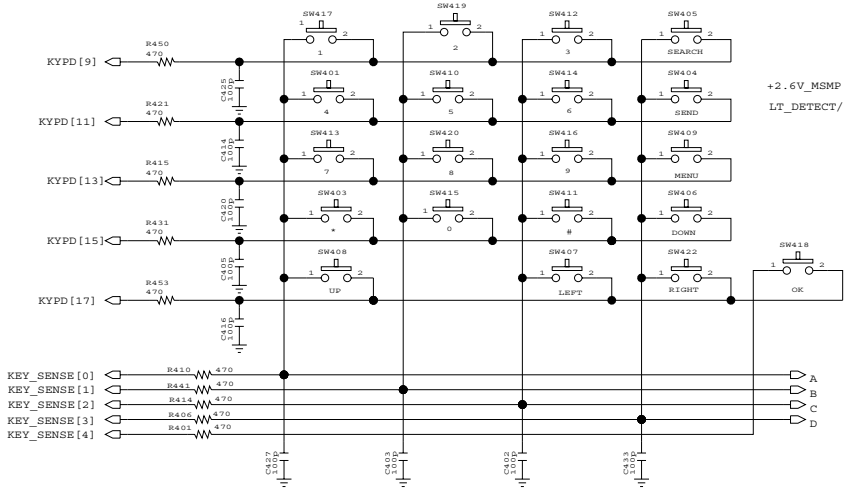


<MIC>

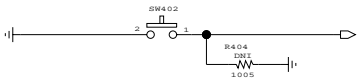


Power Line
Audio Line
MIC Line

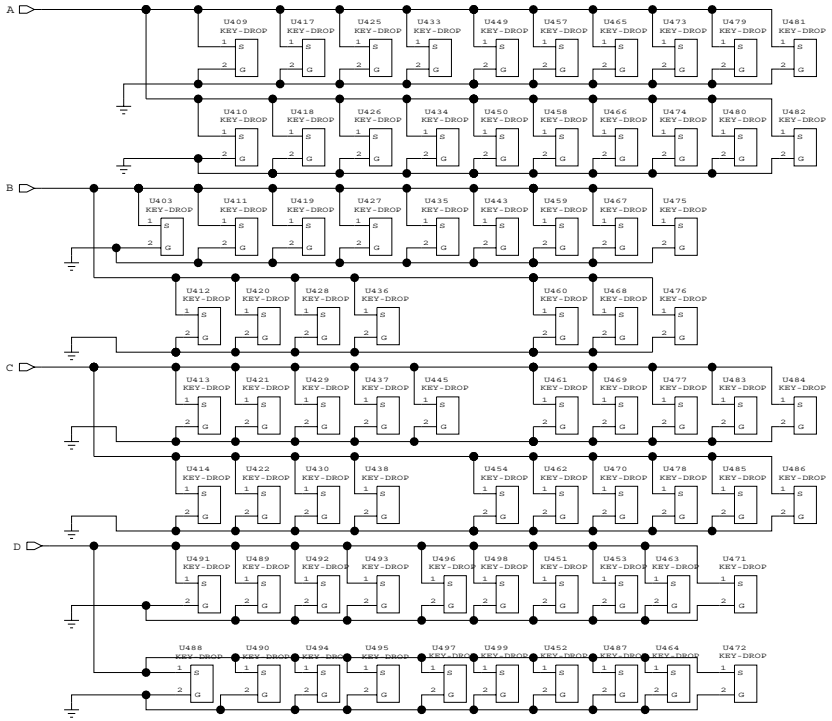
<MAIN KEY>



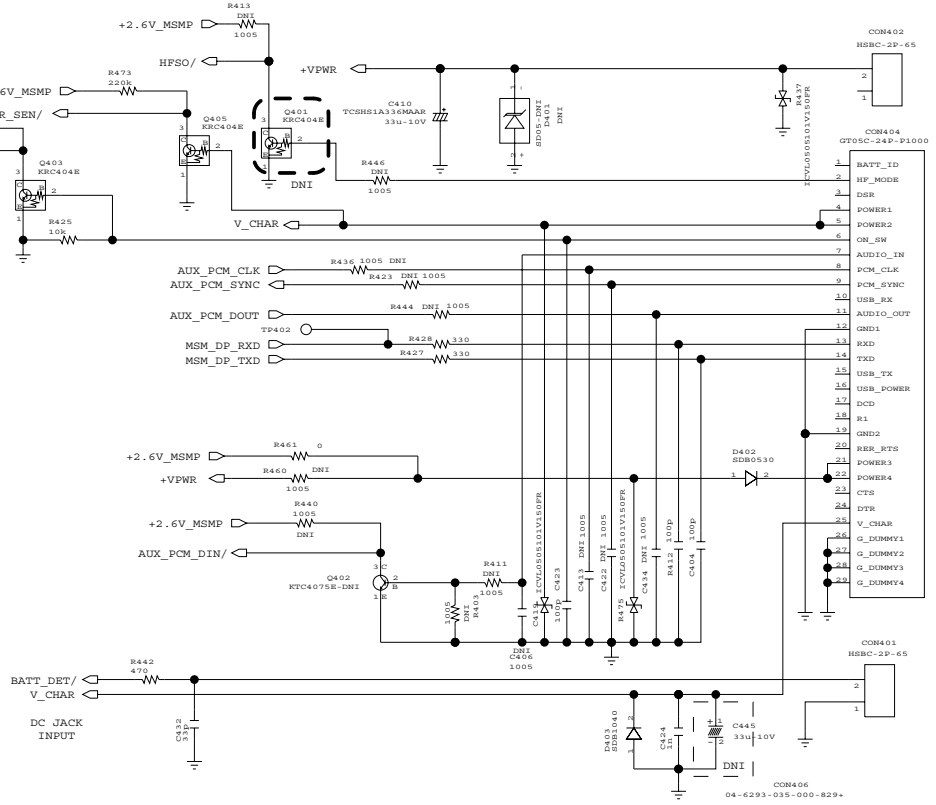
<POWER ON/OFF SWITCH>



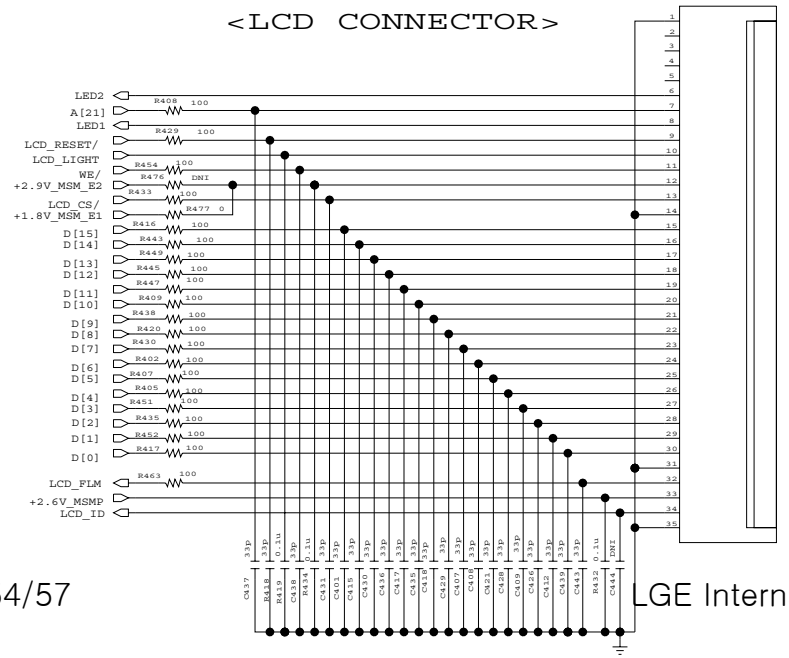
<KYPD KEY-DROP>



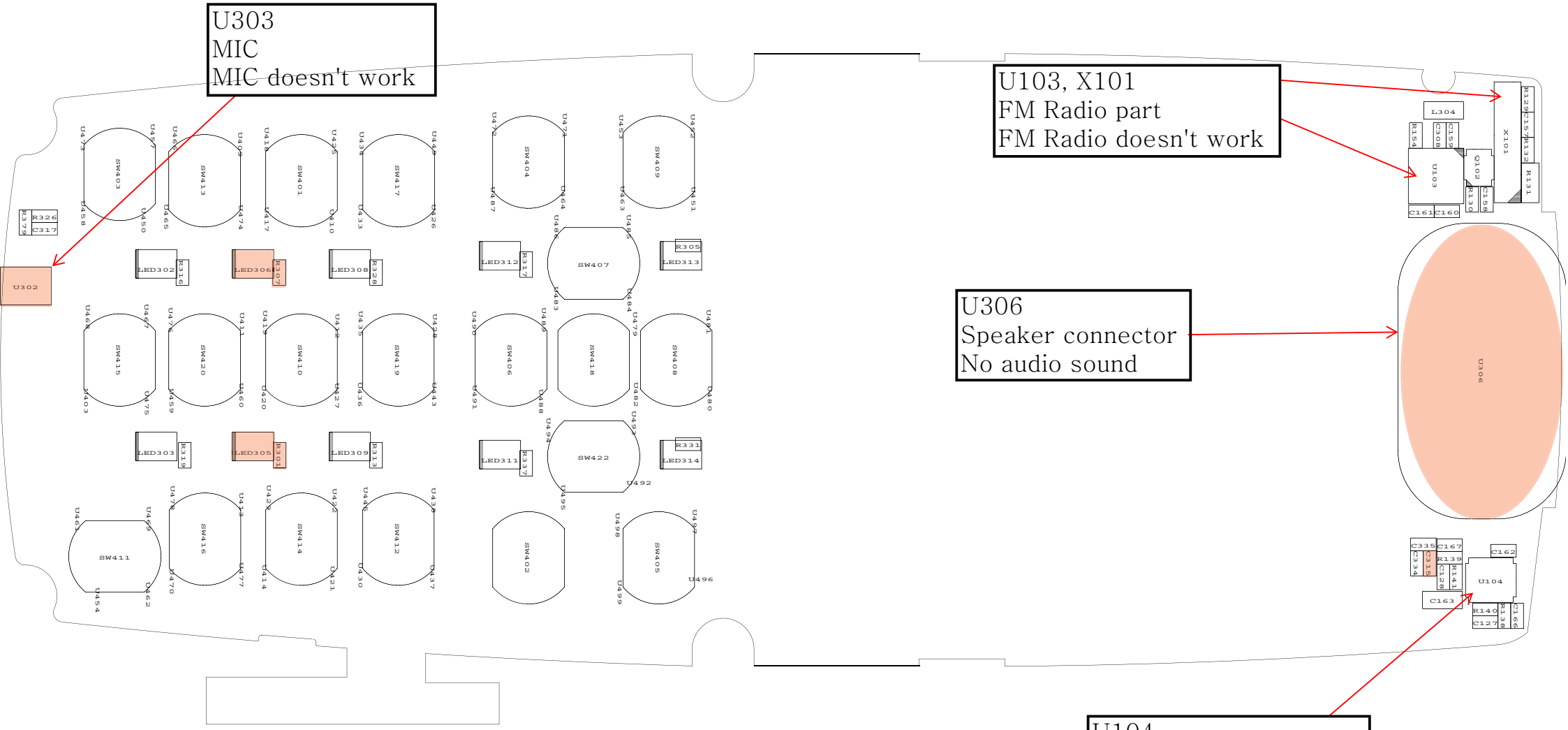
<RECEPTACLE with DC JACK>



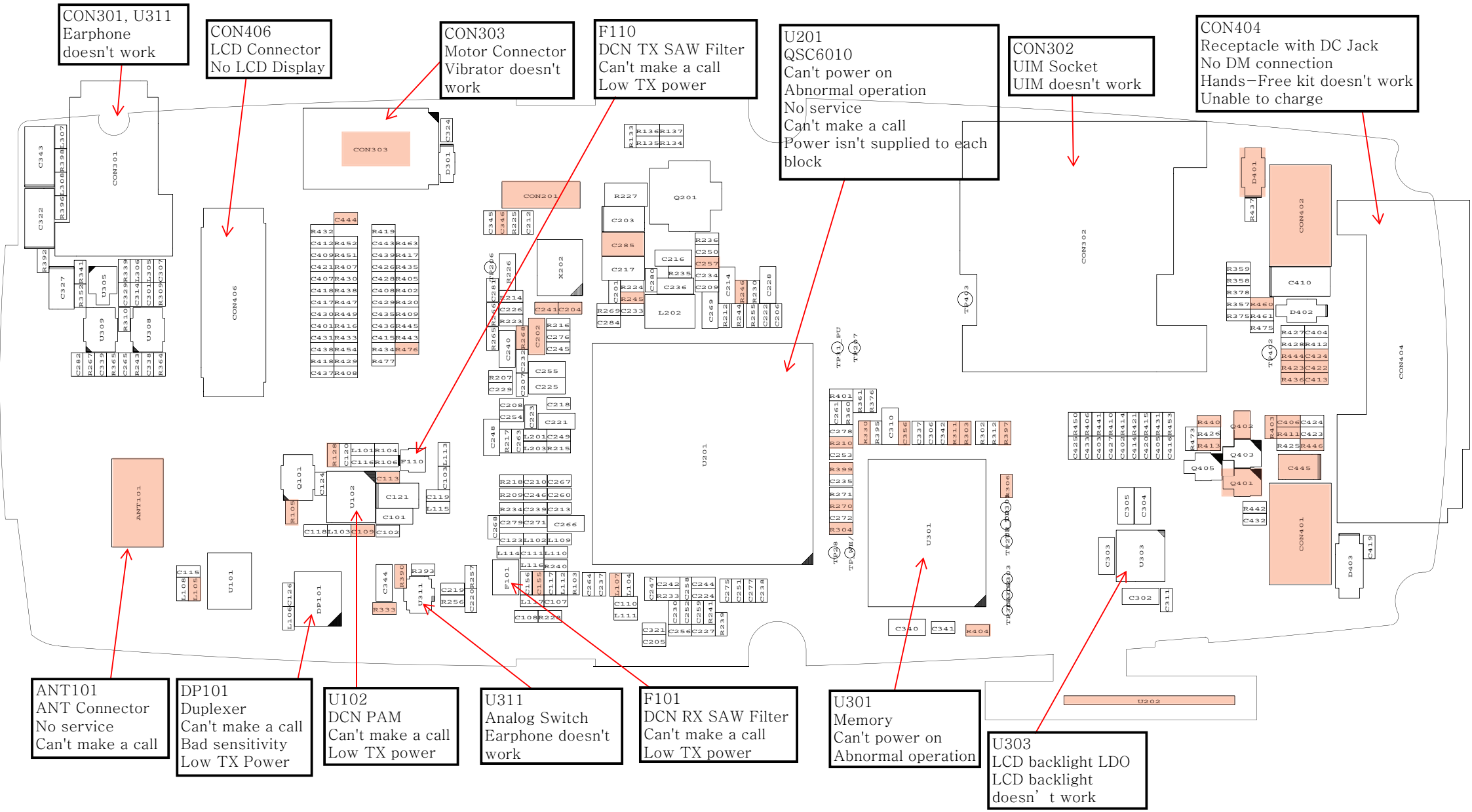
<LCD CONNECTOR>



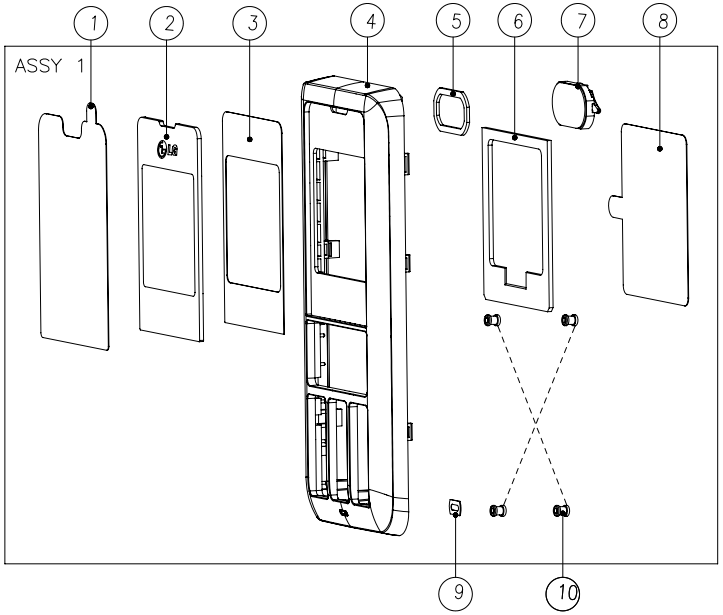
ID3100 Main Rev 1.2 - TOP

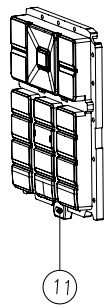


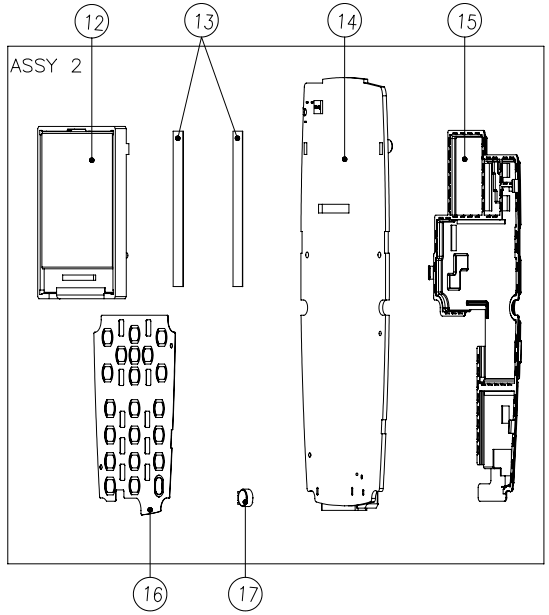
ID3100 Main Rev 1.2 - BOT

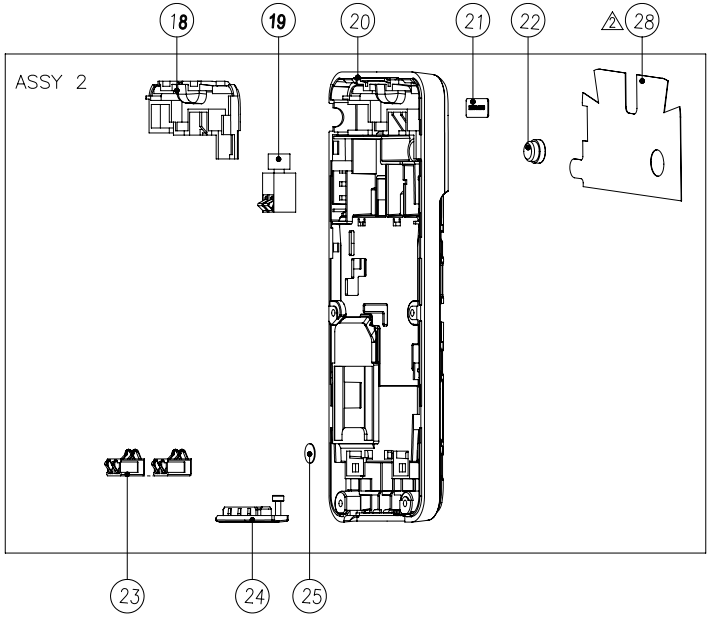


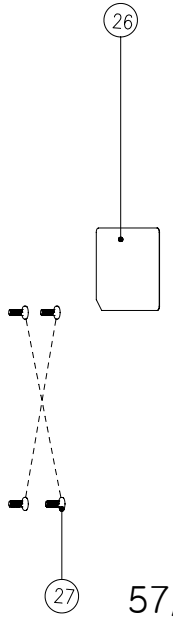
DNI Point











NO.	DESCRIPTION	Q'TY	DRAWING NO.	REMARK
29	PAD	2	MPBZ0182301	
28	TAPE PROTECTION	1	MTAB0180301	Same RD3000
27	SCREW MACHINE BIND	4	GMEY0009201	
26	LABEL APPROVAL	1	MLAA0002505	
25	LABEL A/S	1	MLAB0000601	
24	CAP RECEPTACLE	1	~~MCSE0038001~~ ⚠ MCCE0036302	Same RD3000
23	CONNECTOR ETC	2	ENZY0013201	
22	CAP MOBILE SWITCH	1	~~MCSE0044101~~ ⚠ MCCE0037103	Same RD3000
21	LABEL QUALCOMM	1	MLAN0000601	
20	COVER REAR	1	~~MCJN0066401~~ ⚠ MCJN0066202	Same RD3000
19	VIBRATOR MOTOR	1	SJMY0007904	
18	INTENNA	1	SNMF0033101	Same RD3000
17	MIKE	1	SUMY0003802	
16	DOME ASSY METAL	1	ADCA0065701	Same RD3000
15	SHIELD CAN	1	MCBA0017501	Same RD3000
14	PCB ASSY MAIN SMT	1	SAFF0113702	
13	TAPE LCD	2	MTAZ0188601	Same RD3000
12	LCD	1	SVLM0024701	
11	KEYPAD	1	MKAZ0037202	
10	INSERT	4	MICZ0028601	Same RD3000
9	PAD,MIC	1	MPBH0030001	
8	TAPE,PROTECTION (BACK)	1	**MTAB0162901**	Same RD3000
7	PAD,LCD	1	MPBG0060501	
6	**SPEAKER**	1	SUSY0026601	
5	PAD,SPEAKER	1	MPBN0041301	
4	COVER,FRONT	1	MCJK0070901	
3	TAPE,WINDOW	1	**MTAD0068501**	
2	WINDOW,LCD	1	**MWAC0078502**	
1	TAPE,PROTECTION WINDOW	1	MTAB0169201	

PARTS INDEX

1. Accessory

NO	Discription	LG Part NO	SPEC
1	COVER,BATTERY	MCJA0041303	
2	MANUAL,OPERATION	MMBB0254901	PRINTING,
3	BATTERY PACK,LI-ION	SBPL0088901	3.7 V,950 mAh,1 CELL,PRISMATIC ,553450,INNERPACK ,BLACK
4	EAR PHONE/EAR MIKE SET	SGEY0003211	10mW ,16 OHM ,105dB ,10KHZ ,450HZ ,BLACK,LOW COST STEREO,
5	ADAPTOR,AC-DC	SSAD0020501	100-240V ,50-60 Hz,5.1 V,1 A,CE ,AC-DC Adaptor for Europe,WALL 2P ,DC PIN PLUG ,
6	CARD,WARRANTY	MCDF0001120	

2. PCB

NO	Discription	LG Part NO	Q'ty
1	PCB, MAIN	SPFY0149903	1

3. Mechanical Part

NO	Description	LG Part No.	QTY
1	TAPE,PROTECTION	MTAB0169201	1
2	WINDOW,LCD	MWAC0078502	1
3	TAPE,WINDOW	MTAD0068501	1
4	COVER,FRONT	MCJK0070901	1
5	PAD,SPEAKER	MPBN0041301	1
6	SPEAKER	SUSY0026601	1
7	PAD,LCD	MPBG0060501	1
8	TAPE,PROTECTION(BACK)	MTAB0162901	1
9	PAD,MIKE	MPBH0030001	1
10	INSERT	MICZ0028601	4
11	KEYPAD	MKAZ0037202	1
12	LCD MODULE	SVLM0024701	1

13	TAPE	MTAZ0188601	2
14	PCB ASSY,MAIN,SMT	SAFF0113702	1
15	CAN,SHIELD	MCBA0017501	1
16	DOME ASSY,METAL	ADCA0065701	1
17	MICROPHONE	SUMY0003802	1
18	ANTENNA,MOBILE,FIXED	SNMF0033101	1
19	VIBRATOR,MOTOR	SJMY0007904	1
20	COVER,REAR	MCJN0066202	1
21	LABEL,QUALCOMM	MLAN0000601	1
22	CAP,MOBILE SWITCH	MCCF0037103	1
23	CONNECTOR,ETC	ENZY0013201	2
24	CAP,RECEPTACLE	MCCE0036302	1
25	LABEL,A/S	MLAB0000601	1
26	LABEL,APPROVAL	MLAA0002505	1
27	SCREW MACHINE,BIND	GMEY0009201	4
28	TAPE,PROTECTION	MTAB0180301	1
29	PAD	MPBZ0182301	2
ASSY1	COVER ASSY,FRONT	ACGK0088502	1
ASSY2	PCB ASSY,MAIN	SAFB0072701	1
ASSY3	COVER ASSY,REAR	ACGM0088505	1

4. The Top Of Main PCB

NO	Ref No	Description	LG Part NO.	SPEC
1	C127	CAP,CERAMIC,CHIP	ECCH0000129	120 pF,50V,J,NP0,TC,1005,R/TP
2	C128	CAP,CERAMIC,CHIP	ECCH0000129	120 pF,50V,J,NP0,TC,1005,R/TP
3	C157	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP
4	C158	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP
5	C159	INDUCTOR,CHIP	ELCH0001426	8.2 nH,J ,1005 ,R/TP ,PBFREE
6	C160	CAP,CERAMIC,CHIP	ECCH0002001	100000 pF,6.3V ,K ,B ,HD ,1005 ,R/TP
7	C161	CAP,CERAMIC,CHIP	ECCH0002001	100000 pF,6.3V ,K ,B ,HD ,1005 ,R/TP
8	C162	CAP,CHIP,MAKER	ECZH0001210	470 nF,10V ,Z ,Y5V ,HD ,1005 ,R/TP
9	C163	CAP,CHIP,MAKER	ECZH0001511	2.2 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP
10	C166	CAP,CHIP,MAKER	ECZH0001204	47000 pF,16V ,Z ,Y5V ,HD ,1005 ,R/TP
11	C167	CAP,CHIP,MAKER	ECZH0001204	47000 pF,16V ,Z ,Y5V ,HD ,1005 ,R/TP
12	C308	VARISTOR	SEVY0004301	18 V, ,SMD ,10pF, 1005
13	C317	CAP,CHIP,MAKER	ECZH0001106	4700 pF,25V ,K ,X7R ,HD ,1005 ,R/TP

14	C334	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
15	C335	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
16	L304	INDUCTOR,CHIP	ELCH0001556	270 nH,J ,1608 ,R/TP ,
17	LED302	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED
18	LED303	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED
19	LED308	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED
20	LED309	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED
21	LED311	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED
22	LED312	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED
23	LED313	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED
24	LED314	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED
25	Q102	IC	EUSY0140903	SON-5 ,5 PIN,R/TP ,UNBuffered inverter 1.6x1.6
26	R129	RES,CHIP,MAKER	ERHZ0000412	1200 ohm,1/16W ,J ,1005 ,R/TP
27	R130	RES,CHIP,MAKER	ERHZ0000412	1200 ohm,1/16W ,J ,1005 ,R/TP
28	R131	RES,CHIP	ERHY0000512	10M ohm,1/16W,J,1608,R/TP
29	R132	RES,CHIP,MAKER	ERHZ0000461	300 Kohm,1/16W ,J ,1005 ,R/TP
30	R138	RES,CHIP,MAKER	ERHZ0000237	20 Kohm,1/16W ,F ,1005 ,R/TP
31	R139	RES,CHIP,MAKER	ERHZ0000237	20 Kohm,1/16W ,F ,1005 ,R/TP
32	R140	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP
33	R141	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP
34	R154	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP
35	R305	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP
36	R313	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP
37	R316	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP
38	R317	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP
39	R319	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP
40	R326	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP
41	R328	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP
42	R331	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP
43	R337	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP
44	R379	VARISTOR	SEVY0003601	5.6 V, ,SMD ,100pF, 1005
45	U103	IC	EUSY0320801	QFN ,20 PIN,R/TP ,FM Tuner Chip, 3*3*0.57, Pb Free
46	U104	IC	EUSY0142501	LLP ,8 PIN,R/TP ,Dual 105mW Headphone Amplifier
47	X101	X-TAL	EXXY0016002	32.768 KHz,20 PPM,12.5 pF,65 Kohm,SMD ,6.9*1.4*1.4 ,-40'C ~ +85'C,

				C0 0.8pF, C1 1.9fF ,; ,32.768KHz ,20PPM ,12.5pF , , ,SMD ,R/T P

5. The Bottom Of Main PCB

NO	Ref No	Description	LG Part NO.	SPEC
1	C101	CAP,CHIP,MAKER	ECZH0001511	2.2 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP
2	C102	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
3	C103	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP
4	C107	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
5	C108	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
6	C110	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
7	C111	CAP,CERAMIC,CHIP	ECCH0000107	6 pF,50V,D,NP0,TC,1005,R/TP
8	C115	CAP,CHIP,MAKER	ECZH0000810	9 pF,50V ,D ,NP0 ,TC ,1005 ,R/TP
9	C116	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
10	C117	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
11	C118	CAP,CHIP,MAKER	ECZH0000803	2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP
12	C119	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP
13	C120	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP
14	C121	CAP,TANTAL,CHIP,MAKER	ECTZ0001316	10 uF,10V ,M ,STD ,2012 ,R/TP
15	C123	CAP,CERAMIC,CHIP	ECCH0000107	6 pF,50V,D,NP0,TC,1005,R/TP
16	C124	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP
17	C126	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
18	C156	INDUCTOR,CHIP	ELCH0001410	12 nH,J ,1005 ,R/TP ,Pb Free
19	C201	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
20	C203	CAP,TANTAL,CHIP,MAKER	ECTZ0001316	10 uF,10V ,M ,STD ,2012 ,R/TP
21	C205	CAP,CHIP,MAKER	ECZH0001207	0.082 uF,16V ,Z ,Y5V ,HD ,1005 ,R/TP
22	C206	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
23	C207	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
24	C208	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
25	C209	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
26	C210	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
27	C212	CAP,CHIP,MAKER	ECZH0001121	470 pF,50V ,K ,X7R ,HD ,1005 ,R/TP
28	C213	CAP,CERAMIC,CHIP	ECCH0000149	3.3 nF,50V,K,X7R,HD,1005,R/TP
29	C214	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP
30	C216	CAP,CHIP,MAKER	ECZH0001501	1 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP

31	C217	CAP,CHIP,MAKER	ECZH0025501	4700000 pF,6.3V ,K ,X5R ,TC ,2012 ,R/TP
32	C218	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
33	C219	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
34	C220	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
35	C221	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP
36	C222	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
37	C223	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
38	C224	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
39	C225	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP
40	C226	CAP,CHIP,MAKER	ECZH0003121	68 nF,10V ,K ,X7R ,HD ,1005 ,R/TP
41	C227	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
42	C228	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP
43	C229	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
44	C230	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
45	C232	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
46	C233	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
47	C234	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP
48	C235	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
49	C236	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP
50	C237	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
51	C238	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
52	C239	CAP,CERAMIC,CHIP	ECCH0002002	47000 pF,10V ,K ,B ,HD ,1005 ,R/TP
53	C240	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP
54	C242	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
55	C244	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
56	C245	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
57	C246	CAP,CHIP,MAKER	ECZH0001105	8200 pF,16V ,K ,X7R ,HD ,1005 ,R/TP
58	C247	CAP,CHIP,MAKER	ECZH0001207	0.082 uF,16V ,Z ,Y5V ,HD ,1005 ,R/TP
59	C248	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP
60	C249	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
61	C250	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP
62	C251	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
63	C252	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
64	C253	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
65	C254	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
66	C255	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP

67	C256	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
68	C258	CAP,CHIP,MAKER	ECZH0001216	220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP
69	C259	CAP,CHIP,MAKER	ECZH0001206	0.068 uF,16V ,Z ,Y5V ,HD ,1005 ,R/TP
70	C260	CAP,CHIP,MAKER	ECZH0000801	220 pF,16V ,J ,NP0 ,TC ,1005 ,R/TP
71	C261	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
72	C263	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
73	C264	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
74	C265	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
75	C266	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP
76	C267	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
77	C268	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
78	C269	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP
79	C271	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
80	C272	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
81	C275	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
82	C276	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
83	C277	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
84	C278	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
85	C279	CAP,CHIP,MAKER	ECZH0001207	0.082 uF,16V ,Z ,Y5V ,HD ,1005 ,R/TP
86	C280	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP
87	C281	CAP,CHIP,MAKER	ECZH0001203	33 nF,16V ,Z ,Y5V ,HD ,1005 ,R/TP
88	C282	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
89	C284	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP
90	C301	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
91	C302	CAP,CHIP,MAKER	ECZH0003503	1 uF,25V ,K ,X5R ,HD ,1608 ,R/TP
92	C303	CAP,CHIP,MAKER	ECZH0003503	1 uF,25V ,K ,X5R ,HD ,1608 ,R/TP
93	C304	CAP,CHIP,MAKER	ECZH0003503	1 uF,25V ,K ,X5R ,HD ,1608 ,R/TP
94	C305	CAP,CHIP,MAKER	ECZH0003503	1 uF,25V ,K ,X5R ,HD ,1608 ,R/TP
95	C306	CAP,CERAMIC,CHIP	ECCH0002001	100000 pF,6.3V ,K ,B ,HD ,1005 ,R/TP
96	C307	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP
97	C310	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP
98	C311	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP
99	C314	CAP,CERAMIC,CHIP	ECCH0000153	6.8 nF,25V,K,X7R,HD,1005,R/TP
100	C321	CAP,CHIP,MAKER	ECZH0001207	0.082 uF,16V ,Z ,Y5V ,HD ,1005 ,R/TP
101	C322	CAP,TANTAL,CHIP,MAKER	ECTZ0003704	22 uF,6.3V ,K ,STD ,3216 ,R/TP
102	C324	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP
103	C327	CAP,TANTAL,CHIP,MAKER	ECTZ0003701	10 uF,6.3V ,M ,STD ,2012 ,R/TP

104	C329	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP
105	C337	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
106	C338	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP
107	C339	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP
108	C340	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP
109	C341	CAP,CERAMIC,CHIP	ECCH0002001	100000 pF,6.3V ,K ,B ,HD ,1005 ,R/TP
110	C342	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
111	C343	CAP,TANTAL,CHIP,MAKER	ECTZ0003704	22 uF,6.3V ,K ,STD ,3216 ,R/TP
112	C344	CAP,CHIP,MAKER	ECZH0003501	1 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP
113	C345	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
114	C401	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
115	C402	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
116	C403	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
117	C404	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
118	C405	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
119	C407	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
120	C408	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
121	C409	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
122	C410	CAP,TANTAL,CHIP	ECTH0005103	33 uF,10V ,M ,L_ESR ,3216 ,R/TP
123	C412	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
124	C414	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
125	C415	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
126	C416	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
127	C417	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
128	C418	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
129	C419	VARISTOR	SEVY0003601	5.6 V, ,SMD ,100pF, 1005
130	C420	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
131	C421	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
132	C423	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
133	C424	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP
134	C425	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
135	C426	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
136	C427	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
137	C428	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
138	C429	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
139	C430	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
140	C431	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP

141	C432	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
142	C433	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
143	C435	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
144	C436	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
145	C437	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
146	C438	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
147	C439	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
148	C443	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
149	CON301	CONN,JACK/PLUG,EARPHONE	ENJE0006401	, PIN, ,; ,4P , ,STRAIGHT ,P/TR , , ,
150	CON302	CONN,SOCKET	ENSY0018701	6 PIN,ETC , ,2.54 mm,H=1.8
151	CON404	CONNECTOR,I/O	ENRY0002901	24 PIN,0.5 mm,ANGLE , ,With DC Jack Conn
152	CON406	CONNECTOR,FFC/FPC	ENQY0013901	35 PIN,0.3 mm, Straight, 0.30MM, FPC, straight, both, SMD, R/TP
153	D301	DIODE,SWITCHING	EDSY0009901	ESC ,80 V,300 A,R/TP ,1.6*0.8*0.6(t)
154	D402	DIODE,SWITCHING	EDSY0017702	SOD-323, 30V, 0.5A R/TP, 2.5*1.25*1.0, 0.36V, 30V, 500Ma, 200Mw, 2P
155	D403	DIODE,SWITCHING	EDSY0017701	SOD-123 ,40 V,1 A,R/TP
156	DP101	DUPLEXER,DCN	SDDY0004301	836.5 MHz,881.5 MHz,2.3 dB,3.5 dB,43 dB,55 dB,3.0*2.5*0.8 ,SMD ,HTCC type
157	F101	FILTER,SAW	SFSY0023401	881.5 MHz,2.0*1.4*0.8 ,SMD ,
158	F110	FILTER,SAW	SFSY0031901	836.5 MHz,1.4*1.1*0.45 ,SMD ,824M~849M, IL 2.3, 5pin, B-U, 200_91-50, GSM850, WCDMA V ,; ,836.5 ,1.4*1.1*0.45 ,SMD ,R/TP
159	L101	RES,CHIP,MAKER	ERHZ0000464	330 ohm,1/16W ,J ,1005 ,R/TP
160	L102	INDUCTOR,CHIP	ELCH0001427	2.2 nH,S ,1005 ,R/TP ,Pb Free
161	L103	INDUCTOR,CHIP	ELCH0001405	3.3 nH,S ,1005 ,R/TP ,PBFREE
162	L104	INDUCTOR,CHIP	ELCH0001408	6.8 nH,J ,1005 ,R/TP ,Pb Free
163	L106	INDUCTOR,CHIP	ELCH0001409	10 nH,J ,1005 ,R/TP ,PBFREE
164	L108	INDUCTOR,CHIP	ELCH0001410	12 nH,J ,1005 ,R/TP ,Pb Free
165	L109	INDUCTOR,CHIP	ELCH0001425	82 nH,J ,1005 ,R/TP ,PBFREE
166	L110	INDUCTOR,CHIP	ELCH0001425	82 nH,J ,1005 ,R/TP ,PBFREE
167	L111	INDUCTOR,CHIP	ELCH0001426	8.2 nH,J ,1005 ,R/TP ,PBFREE
168	L112	INDUCTOR,CHIP	ELCH0001430	100 nH,J ,1005 ,R/TP ,PBFREE

169	L113	CAP,CERAMIC,CHIP	ECCH0000178	1.8 pF,50V ,D ,NP0 ,TC ,1005 ,R/TP
170	L114	INDUCTOR,CHIP	ELCH0001413	22 nH,J ,1005 ,R/TP ,PBFREE
171	L115	CAP,CERAMIC,CHIP	ECCH0000178	1.8 pF,50V ,D ,NP0 ,TC ,1005 ,R/TP
172	L116	INDUCTOR,CHIP	ELCH0001427	2.2 nH,S ,1005 ,R/TP ,Pb Free
173	L117	INDUCTOR,CHIP	ELCH0001406	4.7 nH,S ,1005 ,R/TP ,PBFREE
174	L201	INDUCTOR,CHIP	ELCH0001413	22 nH,J ,1005 ,R/TP ,PBFREE
175	L202	INDUCTOR,SMD,POWER	ELCP0008001	4.7 uH,M ,2.5*2.0*1.0 ,R/TP ,
157	F101	FILTER,SAW	SFSY0023401	22 nH,J ,1005 ,R/TP ,PBFREE
158	F110	FILTER,SAW	SFSY0031901	600 ohm,1005 ,
159	L101	RES,CHIP,MAKER	ERHZ0000464	600 ohm,1005 ,
160	L102	INDUCTOR,CHIP	ELCH0001427	1800 ohm,1005 ,Bead
161	L103	INDUCTOR,CHIP	ELCH0001405	1800 ohm,1005 ,Bead
162	L104	INDUCTOR,CHIP	ELCH0001408	UMT5 ,.2 W,R/TP ,
163	L106	INDUCTOR,CHIP	ELCH0001409	330 ohm,1/16W ,J ,1005 ,R/TP
164	L108	INDUCTOR,CHIP	ELCH0001410	2.2 nH,S ,1005 ,R/TP ,Pb Free
165	L109	INDUCTOR,CHIP	ELCH0001425	3.3 nH,S ,1005 ,R/TP ,PBFREE
166	L110	INDUCTOR,CHIP	ELCH0001425	6.8 nH,J ,1005 ,R/TP ,Pb Free
167	L111	INDUCTOR,CHIP	ELCH0001426	10 nH,J ,1005 ,R/TP ,PBFREE
168	L112	INDUCTOR,CHIP	ELCH0001430	12 nH,J ,1005 ,R/TP ,Pb Free
169	L113	CAP,CERAMIC,CHIP	ECCH0000178	82 nH,J ,1005 ,R/TP ,PBFREE
170	L114	INDUCTOR,CHIP	ELCH0001413	82 nH,J ,1005 ,R/TP ,PBFREE
171	L115	CAP,CERAMIC,CHIP	ECCH0000178	8.2 nH,J ,1005 ,R/TP ,PBFREE
172	L116	INDUCTOR,CHIP	ELCH0001427	100 nH,J ,1005 ,R/TP ,PBFREE
173	L117	INDUCTOR,CHIP	ELCH0001406	1.8 pF,50V ,D ,NP0 ,TC ,1005 ,R/TP
174	L201	INDUCTOR,CHIP	ELCH0001413	22 nH,J ,1005 ,R/TP ,PBFREE
175	L202	INDUCTOR,SMD,POWER	ELCP0008001	1.8 pF,50V ,D ,NP0 ,TC ,1005 ,R/TP
176	L203	INDUCTOR,CHIP	ELCH0001413	22 nH,J ,1005 ,R/TP ,PBFREE
177	L305	FILTER,BEAD,CHIP	SFBH0006806	600 ohm,1005 ,
178	L306	FILTER,BEAD,CHIP	SFBH0006806	600 ohm,1005 ,
179	L307	FILTER,BEAD,CHIP	SFBH0008102	1800 ohm,1005 ,Bead
180	L308	FILTER,BEAD,CHIP	SFBH0008102	1800 ohm,1005 ,Bead
181	Q101	TR,BJT,ARRAY	EQBA0000601	UMT5 ,.2 W,R/TP ,
182	Q201	TR,BJT,PNP	EQBP0008701	SC-62 ,0.6 W,R/TP ,PNP TRANSISTOR
183	Q403	TR,BJT,NPN	EQBN0012301	ESM ,100 mW,R/TP ,NPN TRANSISTOR
184	Q405	TR,BJT,NPN	EQBN0012301	ESM ,100 mW,R/TP ,NPN TRANSISTOR

185	R103	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP
186	R104	RES,CHIP,MAKER	ERHZ0000428	18 ohm,1/16W ,J ,1005 ,R/TP
187	R106	RES,CHIP,MAKER	ERHZ0000464	330 ohm,1/16W ,J ,1005 ,R/TP
188	R133	RES,CHIP,MAKER	ERHZ0000457	30 ohm,1/16W ,J ,1005 ,R/TP
189	R134	RES,CHIP,MAKER	ERHZ0000457	30 ohm,1/16W ,J ,1005 ,R/TP
190	R135	RES,CHIP,MAKER	ERHZ0000457	30 ohm,1/16W ,J ,1005 ,R/TP
191	R136	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP
192	R137	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP
193	R207	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP
194	R209	RES,CHIP,MAKER	ERHZ0000221	15 Kohm,1/16W ,F ,1005 ,R/TP
195	R212	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP
196	R214	RES,CHIP,MAKER	ERHZ0000288	470 Kohm,1/16W ,F ,1005 ,R/TP
197	R215	RES,CHIP,MAKER	ERHZ0000351	11800 ohm,1/16W ,F ,1005 ,R/TP
198	R216	RES,CHIP,MAKER	ERHZ0004201	121000 ohm,1/16W ,F ,1005 ,R/TP
199	R217	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP
200	R218	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP
201	R223	RES,CHIP,MAKER	ERHZ0000318	80.6 Kohm,1/16W ,F ,1005 ,R/TP
202	R224	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP
203	R225	RES,CHIP,MAKER	ERHZ0000486	47 Kohm,1/16W ,J ,1005 ,R/TP
204	R226	THERMISTOR	SETY0004501	NTC ,150 Kohm,SMD ,
205	R227	RES,CHIP,MAKER	ERHZ0003901	.1 ohm,1/4W ,F ,2012 ,R/TP
206	R228	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP
207	R230	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP
208	R233	RES,CHIP,MAKER	ERHZ0000441	22 ohm,1/16W ,J ,1005 ,R/TP
209	R234	RES,CHIP,MAKER	ERHZ0000212	12 Kohm,1/16W ,F ,1005 ,R/TP
210	R235	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP
211	R236	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP
212	R239	RES,CHIP,MAKER	ERHZ0000288	470 Kohm,1/16W ,F ,1005 ,R/TP
213	R240	RES,CHIP,MAKER	ERHZ0003202	5.76 Kohm,1/16W ,F ,1005 ,R/TP
214	R241	RES,CHIP,MAKER	ERHZ0000288	470 Kohm,1/16W ,F ,1005 ,R/TP
215	R243	RES,CHIP,MAKER	ERHZ0000488	4.7 ohm,1/16W ,J ,1005 ,R/TP
216	R244	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP
217	R255	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP
218	R256	RES,CHIP,MAKER	ERHZ0000499	5600 ohm,1/16W ,J ,1005 ,R/TP
219	R257	RES,CHIP,MAKER	ERHZ0000499	5600 ohm,1/16W ,J ,1005 ,R/TP
220	R265	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP
221	R266	RES,CHIP,MAKER	ERHZ0000498	56 Kohm,1/16W ,J ,1005 ,R/TP

222	R267	RES,CHIP,MAKER	ERHZ0000488	4.7 ohm,1/16W ,J ,1005 ,R/TP
223	R269	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP
224	R271	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP
225	R302	RES,CHIP,MAKER	ERHZ0000485	4700 ohm,1/16W ,J ,1005 ,R/TP
226	R309	INDUCTOR,CHIP	ELCH0001430	100 nH,J ,1005 ,R/TP ,PBFREE
227	R310	INDUCTOR,CHIP	ELCH0001430	100 nH,J ,1005 ,R/TP ,PBFREE
228	R312	CAP,CHIP,MAKER	ECZH0001102	18000 pF,16V ,K ,X7R ,HD ,1005 ,R/TP
229	R339	RES,CHIP,MAKER	ERHZ0000412	1200 ohm,1/16W ,J ,1005 ,R/TP
230	R341	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP
231	R352	RES,CHIP,MAKER	ERHZ0000485	4700 ohm,1/16W ,J ,1005 ,R/TP
232	R357	CAP,CHIP,MAKER	ECZH0000816	12 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
233	R358	CAP,CHIP,MAKER	ECZH0000816	12 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
234	R359	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP
235	R360	CAP,CHIP,MAKER	ECZH0000816	12 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
236	R361	RES,CHIP,MAKER	ERHZ0000438	20 Kohm,1/16W ,J ,1005 ,R/TP
237	R364	RES,CHIP,MAKER	ERHZ0000410	12 ohm,1/16W ,J ,1005 ,R/TP
238	R365	RES,CHIP,MAKER	ERHZ0000410	12 ohm,1/16W ,J ,1005 ,R/TP
239	R375	RES,CHIP,MAKER	ERHZ0000206	10 ohm,1/16W ,F ,1005 ,R/TP
240	R376	RES,CHIP,MAKER	ERHZ0000206	10 ohm,1/16W ,F ,1005 ,R/TP
241	R378	RES,CHIP,MAKER	ERHZ0000206	10 ohm,1/16W ,F ,1005 ,R/TP
242	R392	RES,CHIP,MAKER	ERHZ0000509	75 ohm,1/16W ,J ,1005 ,R/TP
243	R393	RES,CHIP,MAKER	ERHZ0000509	75 ohm,1/16W ,J ,1005 ,R/TP
244	R395	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP
245	R396	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP
246	R398	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP
247	R401	RES,CHIP,MAKER	ERHZ0000484	470 ohm,1/16W ,J ,1005 ,R/TP
248	R402	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
249	R405	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
250	R406	RES,CHIP,MAKER	ERHZ0000484	470 ohm,1/16W ,J ,1005 ,R/TP
251	R407	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
252	R408	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
253	R409	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
254	R410	RES,CHIP,MAKER	ERHZ0000484	470 ohm,1/16W ,J ,1005 ,R/TP
255	R412	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
256	R414	RES,CHIP,MAKER	ERHZ0000484	470 ohm,1/16W ,J ,1005 ,R/TP
257	R415	RES,CHIP,MAKER	ERHZ0000484	470 ohm,1/16W ,J ,1005 ,R/TP
258	R416	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP

259	R417	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
260	R418	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP
261	R419	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
262	R420	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
263	R421	RES,CHIP,MAKER	ERHZ0000484	470 ohm,1/16W ,J ,1005 ,R/TP
264	R425	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP
265	R426	RES,CHIP,MAKER	ERHZ0000444	22 Kohm,1/16W ,J ,1005 ,R/TP
266	R427	RES,CHIP,MAKER	ERHZ0000464	330 ohm,1/16W ,J ,1005 ,R/TP
267	R428	RES,CHIP,MAKER	ERHZ0000464	330 ohm,1/16W ,J ,1005 ,R/TP
268	R429	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
269	R430	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
270	R431	RES,CHIP,MAKER	ERHZ0000484	470 ohm,1/16W ,J ,1005 ,R/TP
271	R432	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
272	R433	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
273	R434	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP
274	R435	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
275	R437	VARISTOR	SEVY0003601	5.6 V, ,SMD ,100pF, 1005
276	R438	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
277	R441	RES,CHIP,MAKER	ERHZ0000484	470 ohm,1/16W ,J ,1005 ,R/TP
278	R442	RES,CHIP,MAKER	ERHZ0000484	470 ohm,1/16W ,J ,1005 ,R/TP
279	R443	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
280	R445	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
281	R447	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
282	R449	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
283	R450	RES,CHIP,MAKER	ERHZ0000484	470 ohm,1/16W ,J ,1005 ,R/TP
284	R451	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
285	R452	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
286	R453	RES,CHIP,MAKER	ERHZ0000484	470 ohm,1/16W ,J ,1005 ,R/TP
287	R454	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
288	R461	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP
289	R463	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP
290	R473	RES,CHIP,MAKER	ERHZ0000445	220 Kohm,1/16W ,J ,1005 ,R/TP
291	R475	VARISTOR	SEVY0003601	5.6 V, ,SMD ,100pF, 1005
292	R477	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP
293	U101	CONN,RF SWITCH	ENWY0004501	,SMD , dB,H=3.6, Straight type
294	U102	PAM	SMPY0009101	28 dBm,41 %,0.08 A,-50 dBc,28 dB,3.0*3.0*1.15 ,SMD ,

295	U201	IC	EUSY0298001	MSP ,351 PIN,R/TP ,QUALCOMM Single Chip, 15X15 Size
296	U301	IC	EUSY0180602	64M NOR 1.8V 32 psRAM MCP ,88 PIN,R/TP ,L8 W10 H1.2 BALL PITCH0.8
297	U303	IC	EUSY0238702	TSOPJW-12 ,12 PIN,R/TP ,3PORT Charge Pump(AAT2154 Low cost version)
298	U305	TR,BJT,PNP	EQBP0006701	ESM ,100 mW,R/TP ,PNP TRANSISTOR
299	U308	IC	EUSY0263301	SC-88(2.0x2.1) ,6 PIN,R/TP ,Single SPDT Switch, Pb Free
300	U309	IC	EUSY0263301	SC-88(2.0x2.1) ,6 PIN,R/TP ,Single SPDT Switch, Pb Free
301	U311	IC	EUSY0300101	WQFN ,10 PIN,R/TP ,Small package Dual SPDT analog Switch, PB-Free
302	X202	X-TAL	EXXY0024101	19.2 MHz,10 PPM,7 pF,80 ohm,SMD ,3.2*2.5*0.6 , 12ppm at -30'C ~ +85'C,19.2 ,10PPM ,7 , SMD ,R/TP